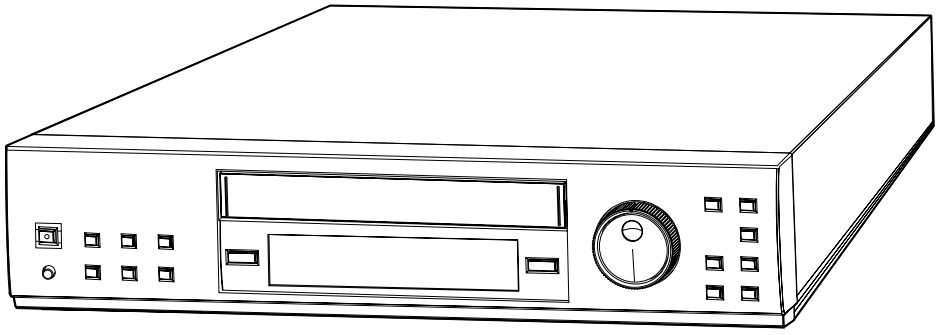
MITSUBISHI

TIME LAPSE VIDEO CASSETTE RECORDER

MODEL

HS-1168E

INSTALLATION AND OPERATION MANUAL



Time Lapse VCR

Only video cassette tapes with the VHS mark may be used with this model.

This instruction manual is important to you.
Please read it before using your video cassette recorder.

ENGLISH
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CE

This Time Lapse Video Cassette Recorder complies with the requirements of the EC Directive 89/336/EEC, “EMC Directive” and 73/23/EEC, “Low Voltage Directive”, as amended by Directive 93/68/EEC. The requirements for the susceptibility according to EN 55024 and the requirements for interference according to EN 55022 are observed for the operation on residential areas, business, light industrial premises and in small scale enterprises, inside as well as outside of the building. All places of operation are characterised by their connection to the public low voltage power supply system.
This unit is manufacture in accordance with EN60065.

Note A point to notice Info. Supplementary information

Caution and Care

CONDENSATION IS THE ENEMY OF VIDEO RECORDERS

■ WHAT IS CONDENSATION?

1. When a very cold drink is poured into a glass, the water droplets which form on the outer surface of the glass are an example of condensation.
2. If the VCR is exposed to a rapid increase in temperature (such as warming it in a cold room or after transporting it from a cold location to a warm one) condensation may form on the tape transport mechanism inside the VCR. By heating the inside of the VCR, it can dry up the moisture and prevent damage to the VCR or video tape from condensation. To do this, plug the VCR in and switch the VCR POWER to ON. Leave the VCR on for at least 2 hours before using it for recording or playback.

■ CONDENSATION IS LIKELY TO OCCUR WHEN:

1. The VCR is moved inside from outdoors or from a cold room to a warm one.
2. A cold room is heated quickly.
3. Humidity is high.

Note

- Avoid using the VCR where cold air (e.g., from an air conditioner) will blow directly on it.

Never place anything containing water on top of the VCR; (e.g., vases, cups, etc.).

Heavy objects (e.g., TV) should never be placed on the VCR

NEVER TOUCH OR INSERT ANY OBJECT INSIDE THE VCR
Touching the inside of the cabinet or inserting foreign objects of any kind not only creates a safety hazard but can also cause extensive damage.

PROTECT THE POWER CORD
Damage to the power cord may cause fire or shock hazard. When unplugging the power cord, hold it by the plug only and pull out carefully.

UNPLUG THE POWER CORD DURING A LONG ABSENCE
Turn the power off and unplug the power cord during a long absence.

MAINTAIN GOOD VENTILATION
Do not obstruct the ventilation holes on the VCR. For maximum ventilation, place the unit on a hard level surface only, and ensure it is not covered during use.

WHEN NOT IN USE
When you finish operating the VCR, always unload the cassette and turn the VCR off.

CABINET CARE
Never use petroleum-based cleaners. Clean with a soft cloth moistened with soap and water and wipe dry. PVC cables or leads should not be left in contact with the cabinet surface for long periods.

INSTALLATION LOCATION
For excellent performance and lasting reliability, install in a location that is:

1. Well ventilated, out of direct sunlight and away from direct heat.
2. A solid, vibration-free surface.
3. Free from high humidity, excessive dust and away from magnetic fields.

Note Never move the VCR without first removing the tape.

CARE OF THE VIDEO CASSETTE TAPES

- Avoid vibration or shock.
- Do not place near a strong magnetic field (e.g., a motor, transformer or magnet).
- Never place or store in direct sunlight.
- Avoid dusty places.
- Place the cassette in its case and store vertically.
- Never store tape in high humidity.

WARNING:
To prevent fire or shock hazard, do not expose this apparatus to rain or moisture.

Features

Up to 224 hours of recording: an ideal video system for automated security and surveillance systems.

Audio Recording

High Resolution and Image Quality

Automatic Head Cleaning

Easy Menu Setting on Screen

Easy Cueing with Alarm Recording

One Button Recording Check

All or Part Front Panel Lock

Protection against Power Failure

Variety of Search Functions

Recording Options for Varies Needs

- Daily/weekly/holiday timer recording
- Alarm recording
- Series recording
- Remote recording
- Repeat recording
- One shot/Interval recording
- Synchronous recording

Special Playback Features

- Still picture
- Speed search using shuttle ring
- Frame-by-frame and field-by-field playback using jog dial

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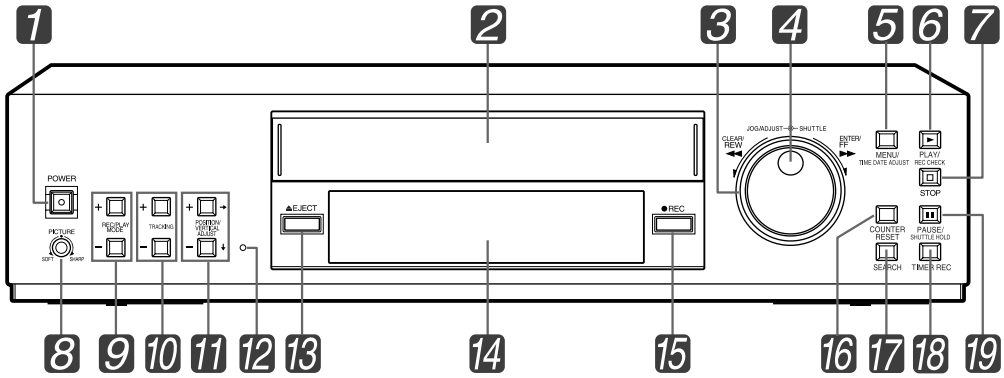
Accessories

1 User's manual
1 Power cord

Controls and Functions

Front View



1 POWER button
Press to turn the VCR POWER on or off.
The Power indicator illuminates when the VCR is turned on.

2 Cassette Loading Slot
Cassette is inserted in this slot for loading.

3 SHUTTLE ring
When the VCR is in stop mode, turn to the right to forward a tape or to the left to rewind.
Also, use for special effects playback or to set the menus.

4 JOG dial
Use to forward/reverse a tape frame-by-frame (field-by-field) or to set the menus.

5 MENU/TIME DATE ADJUST button
When the VCR is turned on, press to display the <MAIN MENU>. Press again to exit the menu.
When the VCR is turned off, press this button for more than 3 seconds to adjust the VCR's time and date.

6 PLAY/REC CHECK button
When the VCR is in stop mode, press to playback a previously recorded tape.
During recording, press for more than 1.5 seconds to check recording function.

7 STOP button
Press to stop all tape related functions.

8 PICTURE control
The picture quality can be adjusted between soft and sharp.

9 REC/PLAY MODE buttons
Press to select the recording or playback speed.

10 TRACKING buttons
Press to reduce/eliminate the noise during playback, slow playback etc.

11 POSITION/VERTICAL ADJUST buttons
- When the day and present time display is shown on the monitor screen, press the top button to move the display to the right forward or bottom button to move it down. During an alarm recording or if an warning is displayed on screen, the day and present time display cannot be moved.
- If screen images are blurred vertically during still picture or special effects playback, press to reduce/eliminate the picture vibration.

12 Lock button
Press to lock the VCR into the current mode.

13 EJECT button
Press to remove the cassette.

14 Fluorescent Display
☞ next page

15 REC button
Press to begin recording.

16 COUNTER RESET button
Press to reset the counter to "00000".

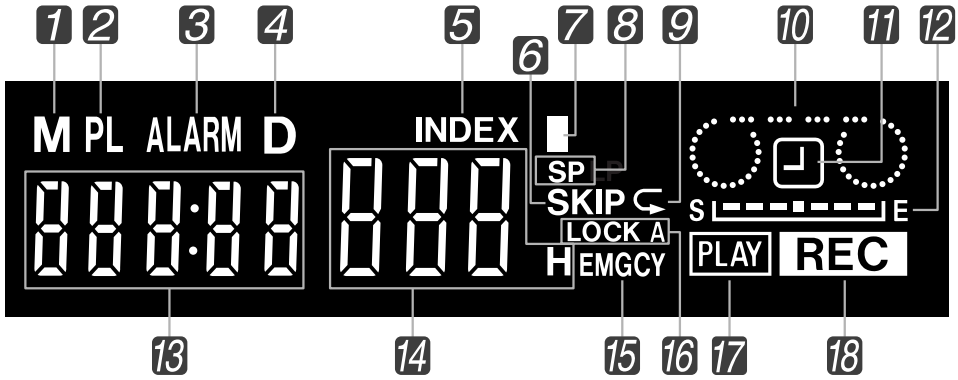
17 SEARCH button
Press to display the <SEARCH FUNCTION> menu.

18 TIMER REC button
Press to start timer recording, when you have programmed your VCR to record.

19 PAUSE/SHUTTLE HOLD button
During recording, press to stop the tape movement temporarily. Press again to continue the recording.
During playback, press to obtain a still picture.
During special effects playback using SHUTTLE ring, press to fix the playback speed.

Controls and Functions (Cont.)

Fluorescent Display



1 M (Counter Memory Stop/Month) indicator
Illuminates during the counter memory stop.
Also, flashes while the VCR is turned off and the month of the VCR's clock has been set on the fluorescent display.

2 PL (Power Loss) indicator
Illuminates when the VCR is turned on after a power failure occurs during recording.

3 ALARM (Alarm Recording) indicator
Flashes during alarm recording and stays on when the alarm recording is finished.

4 D (Time Date Search/Day) indicator
Illuminates during the time date search.
Also, flashes while the VCR is turned off and the day of the VCR's clock has been set on the fluorescent display.

5 INDEX (Index Search) indicator
Flashes when recording an index signal and illuminates during the index number setup and the index search. (Index number is shown on the Recording and Playback Mode display.)

6 SKIP (Skip Search) indicator
Illuminates during the skip search.

7 ▮ (Daylight Saving Time) indicator
Illuminates when "DAYLIGHT SAVINGS" is set to "ON".

8 SP (Tape Speed) indicator
Indicates the tape speed.
SP is standard play.

9 ⊆ (Repeat) indicator
Illuminates when "TAPE END" in "FIRST TIME SET UP" menu is set to "REPEAT" or "ALARM•PROT".

10 (Cassette Status) indicator
Illuminates when a tape is inserted. The light advances, stops or flashes corresponding to the movement of the tape.

11 ⏎ (Timer Recording) indicator
Illuminates when the VCR is in stand-by for timer recording or during timer recording.

12 S E (Tape Remaining) indicator
Indicates the absolute position on the tape. **S** indicates the beginning of the tape and **E** indicates the end of the tape.

13 Counter/Clock display
While the VCR is turned on, indicates the relative position on the tape. (The Counter stops counting where no recording is made on the tape.) When it is off, the clock (24-hour format) is shown.

14 Recording and Playback Mode/Index Number display
Displays the number corresponding to a selected recording or playback mode. The mode shown here varies by the "TAPE LENGTH" setting (E-180 or E-240) in "FIRST TIME SET UP" menu. Also, displays the index number during the index number setup and the index search.

15 EMGCY (Emergency Recording) indicator
Illuminates when "EMERGENCY REC" in "RECORDING SET UP" menu is set to "ON".

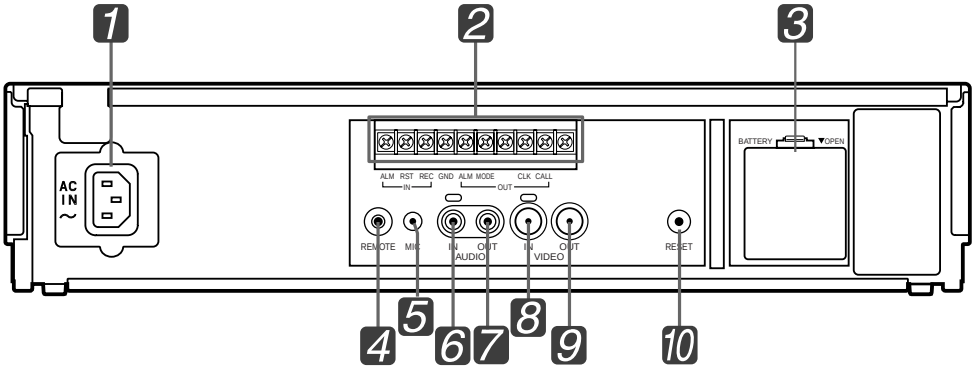
16 Lock/Lock All indicator
LOCK : illuminates when all buttons (except REC button and EJECT button) are locked.
LOCK A : illuminates when all buttons are locked.

17 PLAY (Playback) indicator
Illuminates during playback.

18 REC (Recording) indicator
Illuminates during recording.

Note A point to notice Info. Supplementary information

Rear View



Note Ensure the power cord is not plugged into the outlet before connecting to any rear terminals.

1 AC power socket
This socket connects to the power cord. Insert the cord firmly.

2 Input terminals

ALM IN
Use for alarm recording. The alarm sensor is connected here.

RST IN
Use to stop alarm recording.
- When “ALARM REC DURATION” in “RECORDING SET UP” menu is set to “MAN1”, the alarm recording stops when a signal is input to this terminal. The alarm reset switch is connected here.
- When set to other than “MAN1”, it can be used to adjust the VCR’s clock.

REC IN
Use to start/stop recording or for series recording.

GND
When a lead connected to other terminals requires a ground, connect the ground lead here.

Output terminals

ALM OUT
Use to indicate an alarm recording to an external alarm.

MODE OUT
Use to indicate the VCR’s mode of operation.
- When “MODE OUT” in “REAR TERMINAL” menu is set to “CLOCK ADJ”, the clock of all connected VCR’s can be adjusted. (☞ page 22)

CLK OUT
Use to control an external camera switcher.

CALL OUT
Use to indicate when a tape reaches its end during recording or if there has been a problem during recording.

3 Battery Box
Battery is stored here.

Note
- This VCR contains a special battery. Consult your dealer to replace it.

4 REMOTE jack
Remote control is possible by connecting the remote control unit (R-9100) here. ☞ page 27

5 MIC IN jack
Input jack for a microphone rated at 600Ω impedance.

6 AUDIO IN connector
Audio input connector (RCA pin).

7 AUDIO OUT connector
Audio output connector (RCA pin).

8 VIDEO IN connector
Input connector for video signal (BNC connector). Connect cameras here.

9 VIDEO OUT connector
Output connector for video signal (BNC connector). Connect a monitor here. If the VCR is turned off, the signal from the VIDEO IN connector is looped out to this connector.

10 RESET button
☞ page 32

For the rating of each connector at the rear panel of VCR, ☞ page 31.

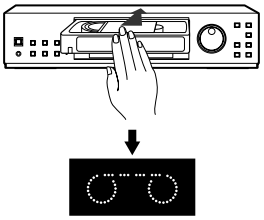
Loading/Unloading a Tape

Tapes can be loaded into your VCR as long as the VCR is plugged into an outlet. Even if the VCR is turned off, loading a tape will automatically cause it to turn on. Use only video cassette tapes marked VHS.

Important notice:
- **Use only standard grade VHS tapes for reliable video recording.**
- **It is recommended to use E-180 tape. Do not use a tape longer than E-240.**

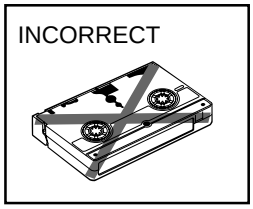
Loading

1. Insert the tape into the cassette slot by holding it, so that the long narrow edge with the contents label faces towards you.
   - The Cassette Status indicator illuminates on the fluorescent display when the tape is inserted.



Note

- Your VCR has a protection circuit which will eject the tape if it is loaded improperly. If the VCR ejects the tape, remove it completely and check that the long narrow edge with the contents label is facing towards you, and the clear plastic window that shows the video tape is facing upwards. Wait a few seconds, and try inserting the tape again.

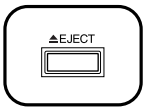


Info.

- The VCR automatically turns on when the tape is loaded, **AUTO POWER ON**.
- The VCR automatically plays back the tape if the erase prevention tab is removed, **AUTO PLAY**.
- You cannot insert a tape while the VCR's all buttons are locked and the Lock All indicator (LOCK A) is illuminated.

Unloading

1. Press **EJECT** button on the front panel of the VCR.
2. Remove the tape.



Note

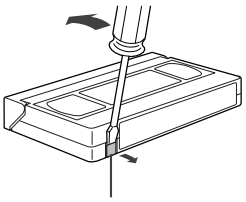
- When ejecting the tape during recording, press **STOP** button once to stop recording and then press **EJECT** button to unload the tape.
- You cannot eject a tape while all of the VCR's buttons are locked and the Lock All indicator (LOCK A) is illuminated.

Info.

- The VCR will eject a tape even if the power to the VCR is turned off (as long as the VCR is plugged into an outlet), **POWER OFF EJECT**.

Preventing accidental erase

Tapes come with an erase prevention tab which, when removed, prevents the tape's contents from being erased or recorded over. If the tape you insert in the VCR has the erase prevention tab removed, your VCR will automatically eject it if you attempt to record on it.



erase prevention tab

Note

- We recommend that you take any broken or torn tapes to a professional for repair. The adhesives on many common types of tape could damage the head of your VCR.

Recommended number of repeat recordings

This chart shows the number of repeat recordings that are recommended before replacing a tape. When you replace the tape, make sure that TAPE LENGTH in the FIRST TIME SET UP menu is set to match the tape you are using.

In case of E-180 setting

Recording time mode	Number of tape use
3H	100
L12H	60
L24H	35
48H	20
72H	15
96H	15
120H	10
168H	8
0H	1

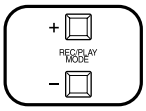
In case of E-240 setting

Recording time mode	Number of tape use
4H	50
L16H	30
L32H	17
64H	5
96H	3
128H	3
160H	2
224H	1
0H	1

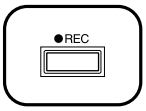
Manual Recording

1. Turn on the VCR and peripheral devices.
2. Load a tape with the erase prevention tab intact.

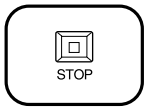
3. Press **REC/PLAY MODE** button to select the desired recording mode.
   ⇨ Refer to Recording/playback time below for the actual recording/playback time when E-180 or E-240 tape is used.



4. Press **REC** button to begin recording.



5. Press **STOP** button to stop recording.



Note

- If the tape you insert in the VCR has the erase prevention tab removed, the VCR will automatically eject it if you attempt to record on it.
- The **REC** button will not function unless a tape is in stop or pause mode.
- A tape recorded by this VCR may not be played back correctly by another VCR.

Info.

- Press the **PAUSE** button to momentarily stop recording. Press it again to resume recording. To protect the tape, the pause mode is automatically cancelled after approximately 5 minutes.

☞

- Page 25 for the VCR's movement when the tape reaches its end during recording.

Recording/playback time

(hours:minutes)

TAPE LENGTH setting / Recording time mode	E-180	TAPE LENGTH setting / Recording time mode	E-240
3H	3:00	**4H**	4:00
L12H	15:00	**L16H**	20:00
L24H	27:00	**L32H**	36:00
48H	51:00	**64H**	68:00
72H	75:00	**96H**	100:00
96H	99:00	**128H**	132:00
120H	123:00	**160H**	164:00
168H	171:00	**224H**	228:00

Note A point to notice Info. Supplementary information

Audio recording/playback

The 3H, 4H mode and the modes with the letter “L” (L12H, L16H, L24H and L32H) are for audio recording and playback on the linear track.

Note

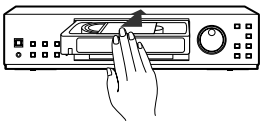
- Audio will not be recorded if peripherals for audio are not connected to the AUDIO IN connector.
- The longer the recording mode is set, the worse the sound quality gets. In L24H or L32H mode, the sound quality is of the degree that the speaking voice can be heard.

Recording Check Function

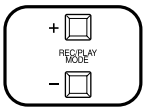
When the VCR is recording, press the **REC CHECK** button for more than 1.5 seconds and then release. The tape will rewind a little and then playback the recording just made. When the tape reaches the position where the **REC CHECK** button was pressed, the VCR starts recording again.

Playback

1. Turn on the VCR and peripheral devices.
2. Load a pre-recorded tape.

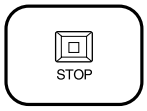


3. Press **REC/PLAY MODE** button to select the desired playback mode.



4. Press **PLAY** button to start playback.
   - If noise occurs during playback, adjust the tracking, ☞ page 17.

5. Press **STOP** button to stop playback.



Info.

- VCR automatically plays back the tape if the erase prevention tab is removed, **AUTO PLAY**.

Note

- Playback mode
  When TAPE LENGTH in FIRST TIME SET UP menu is set to E-180, the playback mode is switched in the order of 3H → L12H → (12H) → L24H → (24H) → 48H → 72H → 96H → 120H → 168H → 0H → 3H → ..
  ( ) can be switched during playback only.
  – If you stop the playback in 12H or 24H mode, the fluorescent display indicates L12H or L24H mode. However, if you start playback again, the playback mode will return to 12H or 24H.
  When TAPE LENGTH in FIRST TIME SET UP menu is set to E-240, the playback mode is switched in the order of 4H → L16H → (16H) → L32H → (32H) → 64H → 96H → 128H → 160H → 224H → 0H → 4H → ..
  ( ) can be switched during playback only.
  – If you stop the playback in 16H or 32H mode, the fluorescent display indicates L16H or L32H mode. However, if you start playback again, the playback mode will return to 16H or 32H.
- Picture jitter or noise may occur when the tape is played back in L12H-224H or 0H mode (even if the tape was recorded in L12H-224H or 0H mode).
- When a pre-recorded tape is used for recording, the coloured noise may appear on the beginning of the playback picture.
- There is normal sound playback only when a tape recorded in 3H, 4H, L12H, L16H, L24H or L32H mode is played back in its respective mode.

☞ page 18-19 to find a picture you wish to view.

When the tape reaches its end during playback/fast forwarding

This function varies according to the setting of TAPE END in the FIRST TIME SET UP menu.

VCR's function / TAPE END setting	Playback	Fast Forward
STOP or REWIND	Stop	Stop
REPEAT or ALARM•PROT	VCR automatically rewinds to the beginning of the tape and stops.	Stop

☞ page 25 for TAPE END setting.

Rewinding a tape

While the tape is stopped, turn **SHUTTLE** to the left.

To stop rewinding, press **STOP** button.

Fast forwarding a tape

While the tape is stopped, turn **SHUTTLE** to the right.

To stop fast forwarding, press **STOP** button.

Info.

- The fast forward/rewind time of a E-180 tape is approximately 2 minutes, however, the time varies by the type of a tape you use.

Audio playback and picture quality

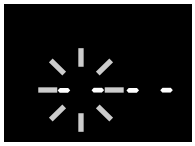
Playback mode	3H, 4H	L12H, L16H, L24H, L32H	12H, 16H, 24H, 32H, 48H-224H, 0H
Audio playback	Available	Available	Not available
Picture Quality	Good	Vibrating	Less vibrating

Adjusting the Clock

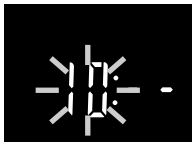
You can adjust the VCR’s clock on the front panel, even though the VCR is turned off. This function lets you to set in the order of time, month, day and year, so it is convenient for making the fine adjustment of the time.

Example : Setting the day and present time to 10:38 a.m., 11th December, 2002.

1. When the VCR and peripheral devices are turned off, press **MENU** button for more than 3 seconds.
   - The hour digits of the clock on the fluorescent display starts flashing.



2. Turn **JOG** to set the hour digits.
   ⇨ When the flashing item is same as the current time, turn **SHUTTLE** without turning **JOG**.



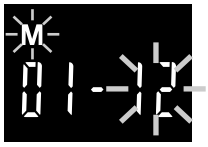
3. Turn **SHUTTLE** to the right to make the 10-minute digit flash and turn **JOG** to adjust.

Adjusting the Clock (Cont.)

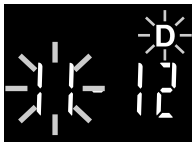
4. Turn **SHUTTLE** to the right to make the 1-minute digit flash and turn **JOG** to adjust.

   ⇨ To finish the clock adjustment now, press **MENU** button for more than 3 seconds.

5. Turn **SHUTTLE** to the right to make the month digits flash and turn **JOG** to adjust.
   - The Month indicator (**M**) flashes.



6. Turn **SHUTTLE** to the right to make the day digits flash and turn **JOG** to adjust.
   - The Day indicator (**D**) flashes.



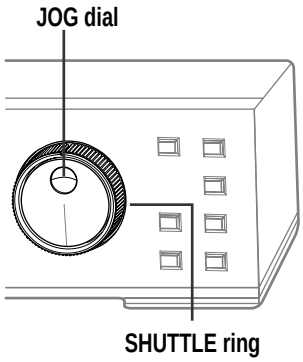
7. Turn **SHUTTLE** to the right to make the year digits flash and turn **JOG** to adjust.

8. Turn **SHUTTLE** to the right.
   - The VCR's clock is set now.

When adjusting the clock to the exact second

Set the clock as described above, but set 1-minute digit to one or two minutes ahead of the reference time being used. After the step 7 above, when reference time reaches 00 second of the minute you have chosen, turn SHUTTLE to the right. The VCR's clock now corresponds to the reference time to the nearest second.

Info. Use of **JOG** dial and **SHUTTLE** ring for menu setting



JOG dial
- Use **JOG** by placing a finger in the indent and turning.
- Turning **JOG** to the right moves the selection forward. Turning it to the left moves the selection back.
- If the selection is not flashing, turn **JOG** to the right to move the cursor (▷) down one position then to the left to move back to your selection.

SHUTTLE ring
- If you turn **SHUTTLE** to the right/left end and release it, **SHUTTLE** comes back to the centre position automatically.
- Navigate to the next menu layer by turning **SHUTTLE** to the right. Return to the previous menu layer by turning **SHUTTLE** to the left.

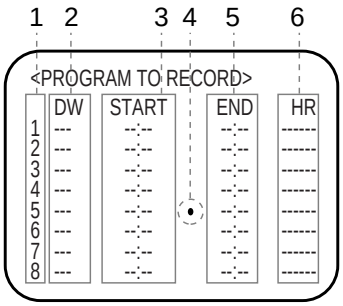
Note A point to notice Info. Supplementary information

Recording Techniques

ENGLISH

Timer Recording

Accurately preset the day and present time before timer programming. (☞ page 9 or 22)



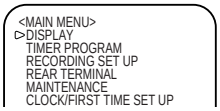
E-180	3SP → L12SP → L24SP → 48SP → 72SP → 96SP → 120SP → 168SP → 0SP → SKIP
E-240	4SP → L16SP → L32SP → 64SP → 96SP → 128SP → 160SP → 224SP → 0SP → SKIP

1) Program number
   Up to 8 programs can be set.
2) Day of the week display
   - Display **HLD** to apply HOLIDAY SET UP setting (☞ see below).
   - Display **SPL** to apply SPECIAL DW setting (☞ next page).
   - Display **DAY** to record at the programmed time everyday.
3) Recording start-time
4) Next day indicator (•)
   Recording continues to the following day.
5) Recording end-time
6) Recording mode
   - Recording mode varies by the TAPE LENGTH setting of FIRST TIME SET UP menu. See the table shown to the left.
   - Timer recording will not be performed when set to **SKIP**.

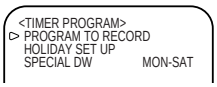
Info. • Time is displayed in 24-hour format.

Example : Setting the program number 2 to the L12H mode timer recording from 12:00 to 15:00 every Tuesday.

1. Press **MENU** button.
   - **<MAIN MENU>** appears.



2. Turn **JOG** to select **TIMER PROGRAM** and turn **SHUTTLE** to the right.
   - **<TIMER PROGRAM>** menu appears.



3. When the cursor (▷) is next to **PROGRAM TO RECORD**, turn **SHUTTLE** to the right.
   - **<PROGRAM TO RECORD>** menu appears.

4. Turn **JOG** to select the program number and turn **SHUTTLE** to the right to select.

5. In the **DW** column, turn **JOG** to select the Day of the Week. Turn **SHUTTLE** to the right to select.

6. In the **START** column, turn **JOG** to select the *hour* digits of the start time. Turn **SHUTTLE** to the right when done.
   ⇨ Set the *10-minute* digit and *1-minute* digit in a similar fashion.

7. In the **END** column, turn **JOG** to select the *hour* digits of the end time. Turn **SHUTTLE** to the right when done.
   ⇨ Set the *10-minute* digit and *1-minute* digit in a similar fashion.

8. In the **HR** column, turn **JOG** to select the RECORDING mode.

Setup step 9 to make recording while the REC IN terfminal is grounded. If not, go to step 10.

9. Press **MENU** button.
   - The program you are currently setting is highlighted.
   - Press **MENU** button again to cancel.

10. Turn **SHUTTLE** to the right when done. (Cursor flashing will stop.)
    - If the program has not been set completely, the **DW** column will continue to flash.

    ⇨ Repeat steps 4 to 10 to set 2 or more programs at once.

11. Press **MENU** button.
    - The day and present time display appears on screen.

12. Press **TIMER REC** button.
    - The VCR is turned off and the Timer Recording indicator (⏎) illuminates on the fluorescent display.

    ⇨ When **TIMER REC** button is pressed during the programmed period, the VCR starts recording immediately.

Info. When the Timer Recording indicator (⏎) starts flashing:

a) A tape is not inserted.
b) A tape without erase prevention tab is inserted.
c) Day and present time has not been set.
d) Timer program has not been set.
e) Menu item has been set (flashing).

– Remedy -

1. Press **TIMER REC** button to turn off the Timer Recording indicator (⏎).
2. a) Insert a tape.
   b) Insert a tape with erase prevention tab intact.
   c) Set the day and present time. (☞ page 9 or 22)
   d) Confirm the program.
   e) Turn **SHUTTLE** to the right to stop flashing.
3. Press **TIMER REC** button to turn on the Timer Recording indicator.

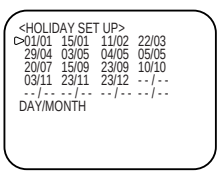
Info.

- **To erase a program:**
  Select the program number you wish to erase, turn **SHUTTLE** to the right (**DW** column flashes) and then turn **SHUTTLE** to the left.

Holiday set up

Up to 20 days per year can be set for days for when the timer recording will be performed, or if HR in PROGRAM TO RECORD menu is set to SKIP, the timer recording will not be performed during the programmed period.

1. Display **<TIMER PROGRAM>** menu.
2. Turn **JOG** to select **HOLIDAY SET UP** and turn **SHUTTLE** to the right.
   - **<HOLIDAY SET UP>** menu appears.
3. Turn **JOG** to move the cursor (▷) and turn **SHUTTLE** to the right.
   - Each time **JOG** is turned to the right, the cursor moves towards right-forward direction.



Recording Techniques (Cont.)

4. Turn **JOG** to select the day you want, and turn **SHUTTLE** to the right.
5. Turn **JOG** to select the month you want, and turn **SHUTTLE** to the right.

   ⇨ Repeat steps 3 to 5 to set 2 or more days at once.
6. Press **MENU** button.
   - The day and present time display appears on screen.

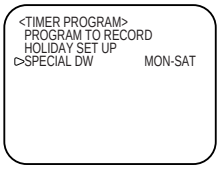
Info.

- To erase the pre-set month and day, turn **SHUTTLE** to the left while the day item is flashing.

Special day of the week

Set the recording period by specifying the start and end day of the week for timer recording.

1. Display **<TIMER PROGRAM>** menu.
2. Turn **JOG** to select **SPECIAL DW** and turn **SHUTTLE** to the right.
3. Turn **JOG** to set the start and end day of the week, and turn **SHUTTLE** to the right.
4. Press **MENU** button.
   - The day and present time display appears on screen.



Note

- Start day of the week and end day of the week cannot be identical.

When the recording period of 2 or more programs are overlapped

The VCR always gives priority to the higher-numbered program.

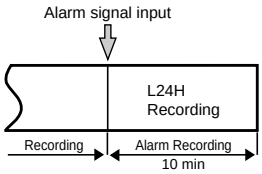
Info.

- To make sure that the HOLIDAY SET UP setting is applied correctly, set a timer program with **HLD** in **DW** column to the higher-numbered program.

Alarm Recording

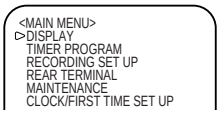
If an alarm occurs, the VCR switches to alarm recording.

Example)
When ALARM REC MODE is set to L24H and ALARM REC DURATION is 10 min.

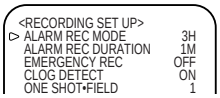


☞ page 20 for alarm recording connection

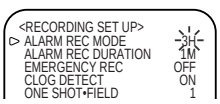
1. Press **MENU** button.
   - **<MAIN MENU>** appears.



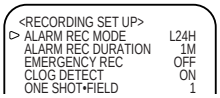
2. Turn **JOG** to select **RECORDING SET UP** and turn **SHUTTLE** to the right.
   - **<RECORDING SET UP>** menu appears.



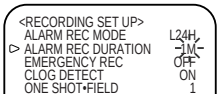
3. When the cursor (▷) is next to **ALARM REC MODE**, turn **SHUTTLE** to the right.



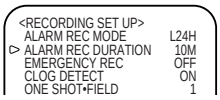
4. Turn **JOG** to set the alarm recording mode you want and turn **SHUTTLE** to the right.



5. Turn **JOG** to select **ALARM REC DURATION** and turn **SHUTTLE** to the right.



6. Turn **JOG** to set the alarm recording duration you want and turn **SHUTTLE** to the right.
   - When set to **MAN 1**, alarm recording continues until RST IN terminal is grounded.
   - When set to **MAN 2**, alarm recording continues while ALM IN terminal is grounded.



7. Press **MENU** button.
   - The day and present time display appears on screen.

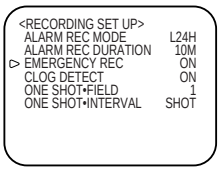
Info.

- The index signal is automatically recorded when an alarm recording begins. (The Index indicator (**INDEX**) flashes on the fluorescent display).
- Even if an alarm recording is proceeding, the new alarm recording starts when the next alarm signal is input. (While an index signal is being recorded and then the next signal is input, the second signal may not be detected during skip or index search.)
- An alarm recording continues till its end during timer recording, even if the timer recording end-time reaches.
- An alarm recording will be cancelled if the tape reaches its end.
- If the interval between two alarm recording start-times is too short, the skip or index search may not function correctly. (☞ for the minimum interval between two alarm recording start-times, go to page 18)

Emergency Recording

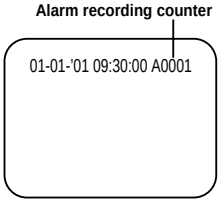
The VCR automatically starts an alarm recording when an alarm signal is input even if the VCR is in stop mode, turned off or in stand-by for timer recording. After an emergency recording, the VCR automatically returns to its original state. Providing EMERGENCY REC is ON, the Emergency Recording indicator (EMGCY) illuminates on the fluorescent display.

1. After step 6 of ***Alarm Recording***, turn **JOG** to select **EMERGENCY REC** and turn **SHUTTLE** to the right.
2. Turn **JOG** to select **ON** and turn **SHUTTLE** to the right.



Display during alarm recording

- During the alarm recording, the alarm recording counter will automatically be displayed on screen if DISPLAY MODE (☞ page 24) is set to 1, 2 or 3.
- The Alarm Recording indicator (ALARM) on the fluorescent display flashes during alarm recording and stays on when the alarm recording is finished.
- The alarm recording counter shows up to 9999 alarm recordings, then it is reset to 0000 and continues counting.
- When initialising the alarm recording list, the alarm recording counter will also be reset.

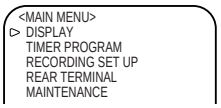


Note A point to notice Info. Supplementary information

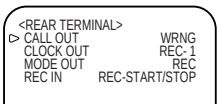
Series Recording 1

Series recording is possible if two or more of these units are connected. When the first VCR's tape reaches its end or an error occurs on VCR, the second VCR automatically begins recording.

1. Press **MENU** button.
   - **<MAIN MENU>** appears.

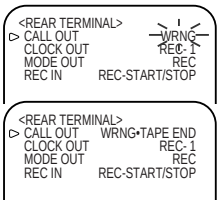


2. Turn **JOG** to select **REAR TERMINAL** and turn **SHUTTLE** to the right.
   - **<REAR TERMINAL>** menu appears.



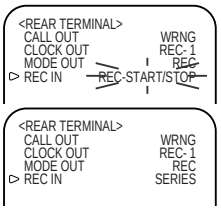
Step 3 and 4 on 1st VCR only:

3. When the cursor (▷) is next to **CALL OUT**, turn **SHUTTLE** to the right.
4. Turn **JOG** to select **WRNG•TAPE END** and turn **SHUTTLE** to the right.



Step 5 and 6 on 2nd VCR only:

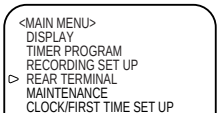
5. Turn **JOG** to select **REC IN** and turn **SHUTTLE** to the right.
6. Turn **JOG** to select **SERIES** and turn **SHUTTLE** to the right.
7. Press **MENU** button.
   - The day and present time display appears on screen.



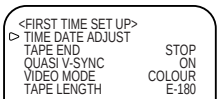
Series Recording 2

Series Recording 2 provides a function: when the first VCR's tape reaches its end, the second VCR automatically begins recording. When the tape in second VCR finishes, the first VCR starts recording again. (The two VCRs keep recording one after another.) Setup both 1st and 2nd VCRs as in the steps below.

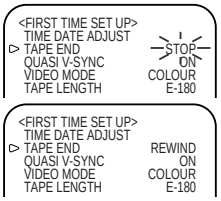
1. Repeat step 1 to 6 of ***Series Recording 1***.
   ⇨ Steps 3 to 6 must be set to both 1st and 2nd VCRs.
2. Turn **SHUTTLE** to the left.
   - **<MAIN MENU>** appears.



3. Turn **JOG** to select **CLOCK/FIRST TIME SET UP** and turn **SHUTTLE** to the right.
   - **<FIRST TIME SET UP>** menu appears.



4. Turn **JOG** to select **TAPE END** and turn **SHUTTLE** to the right.
5. Turn **JOG** to select **REWIND** and turn **SHUTTLE** to the right.



6. Press **MENU** button.
   - The day and present time display appears on screen.

☞ page 21 for series recording connection

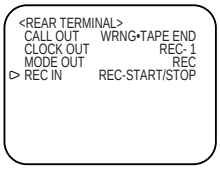
Note

- Timer or emergency recording function cannot be used with series recording at the same time.

Remote Recording

This function permits you to control the start/end of recording from the remote place. The VCR starts recording when the REC IN terminal is grounded. (☞ page 21 for remote recording connection)

1. Display **<REAR TERMINAL>** menu.
2. Set **REC IN** to **REC-START/STOP**.
3. Press **MENU** button.
   - The day and present time display appears on screen.



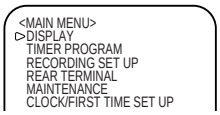
Note

- An index signal will not be recorded during remote recording.
- Series or timer recording function cannot be used with remote recording at the same time.

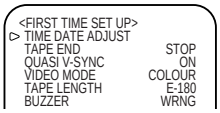
Repeat Recording

With this function, when the tape reaches its end during recording, the VCR rewinds the tape and starts recording again.

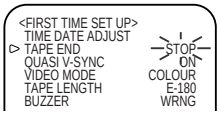
1. Press **MENU** button.
   - **<MAIN MENU>** appears.



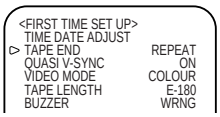
2. Turn **JOG** to select **CLOCK/FIRST TIME SET UP** and turn **SHUTTLE** to the right.
   - **<FIRST TIME SET UP>** menu appears.



3. Turn **JOG** to select **TAPE END** and turn **SHUTTLE** to the right.



4. Turn **JOG** to select **REPEAT** or **ALARM•PROT** and turn **SHUTTLE** to the right.
   - Repeat indicator (↻) illuminates on the fluorescent display.
   ⇨ Refer to the table below for REPEAT and ALARM•PROT.



5. Press **MENU** button.
   - The day and present time display appears on screen.

When the tape reaches its end during recording

The following functions are automatically engaged when the tape ends during recording.

TAPE END setting	When there are alarm recordings on tape	When there is NO alarm recording on tape
ALARM• PROT	The tape stops.(*)	The tape is rewound automatically to the beginning and then recording is resumed.
STOP	The tape stops.	
REWIND	The tape is rewound automatically to the beginning (except in timer recording) and then stops.	
REPEAT	The tape is rewound automatically to the beginning and then recording is resumed (also recording over existing alarms).	

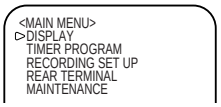
* To repeat recording on the same tape again, eject the tape once and reinsert.

Recording Techniques (Cont.)

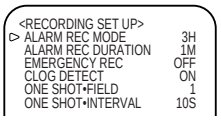
One shot/Interval Recording

One shot recording allows you to control the number of fields to be recorded when the REC button is pressed or the REC IN terminal is grounded. Interval recording is made at the selected number of fields and at the selected interval.

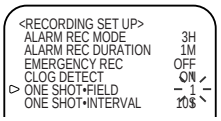
1. Press **REC/PLAY MODE** button on the front panel to set the recording mode to **0H**.
2. Press **MENU** button.
   - **<MAIN MENU>** appears.



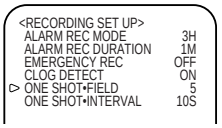
3. Turn **JOG** to select **RECORDING SET UP** and turn **SHUTTLE** to the right.
   - **<RECORDING SET UP>** menu appears.



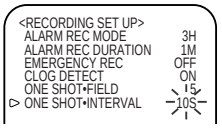
4. Turn **JOG** to select **ONE SHOT•FIELD** and turn **SHUTTLE** to the right.



5. Turn **JOG** to select the number of recording field and turn **SHUTTLE** to the right.

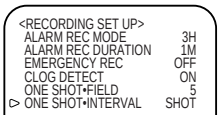


6. Turn **JOG** to select **ONE SHOT•INTERVAL** and turn **SHUTTLE** to the right.



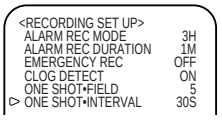
For one shot recording, setup step 7 only:

7. Turn **JOG** to select **SHOT** and turn **SHUTTLE** to the right.



For interval recording, setup step 8 only:

8. Turn **JOG** to select the recording interval and turn **SHUTTLE** to the right.



9. Press **REC** button.
   - The one shot recording will be on standby mode.
   - The VCR starts the interval recording with the interval time selected in step 8 above.
10. To start one shot recording, press **REC** button again or contact the REC IN terminal on the rear panel to the ground.

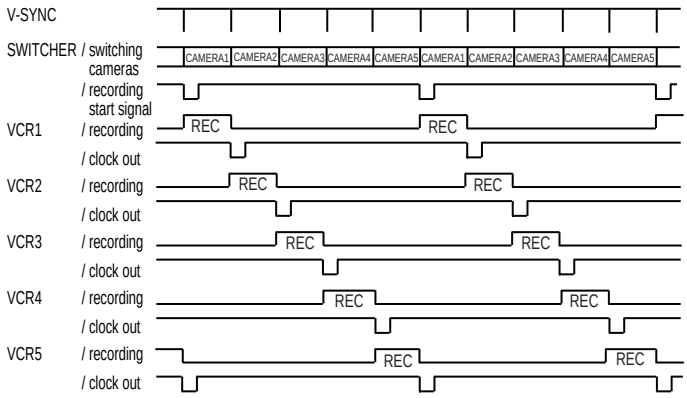
Note

- If no recording is made for about 5 minutes during one shot recording standby mode, the VCR automatically records the number of fields selected in step 5.

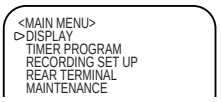
Synchronous Recording

A number of camera images can be mixed together through a camera switcher and then recorded separately onto several VCRs. A camera is assigned to each VCR with the VCR recording only the camera image it has been assigned. This allows recording without gaps.

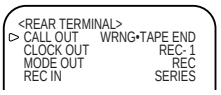
If you have 5 VCRs, the video signal from 5 cameras can be recorded separately by connecting the switcher as shown below:



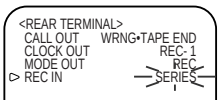
1. Press **MENU** button.
   - **<MAIN MENU>** appears.



2. Turn **JOG** to select **REAR TERMINAL** and turn **SHUTTLE** to the right.
   - **<REAR TERMINAL>** menu appears.

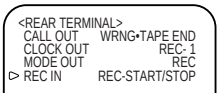


3. Turn **JOG** to select **REC IN** and turn **SHUTTLE** to the right.

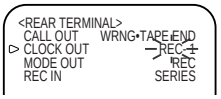


Steps 4 to 7 on VCR1 only:

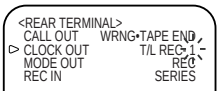
4. Turn **JOG** to select **SERIES** or **REC-START/STOP** and turn **SHUTTLE** to the right.
   - If the recording start signal is available on the switcher, select **SYNC REC**.



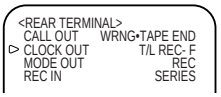
5. Turn **JOG** to select **CLOCK OUT** and turn **SHUTTLE** to the right.



6. Turn **JOG** to select **T/L REC** and turn **SHUTTLE** to the right.

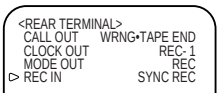


7. Turn **JOG** to select **F** and turn **SHUTTLE** to the right.



Step 8 on all VCRs except VCR1:

8. Turn **JOG** to select **SYNC REC** and turn **SHUTTLE** to the right.



9. Press **MENU** button.
   - The day and present time appears on screen.

page 21 for synchronous recording connection

Note A point to notice Info. Supplementary information

Note

- The recording mode must be set to L12H, L16H, L24H or L32H.
- The suitable number of VCRs and cameras to be connected are shown below:

Recording time mode	VCR	Number of cameras
L12H, L16H	5	Multiple of 5
L24H, L32H	9	Multiple of 9

Additional Features

Memory backup in case of power failure

This VCR includes a built-in backup memory, so the preset day and present time will remain in memory even if there is a power failure. However, if the power cord is disconnected for a long period of time (2-3 months), the present time may not be accurate. In this case, set the clock again.

Info.

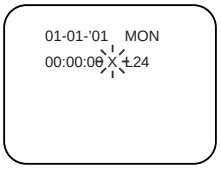
- The battery is fully charged if the VCR's power cord is plugged into the outlet for 40 or more hours per week.
- If the battery is fully charged, even if the power cord is not plugged in, the following settings will remain in memory for up to 31 days:
  - The day and present time display
  - Alarm list
  - Power loss list
  - Number of tape uses
  - Counter display
  - Recording/Playback mode

Note

- When ALARM REC DURATION of the RECORDING SET UP menu is set to MAN1 or MAN2 and a power failure occurs during the alarm recording, the VCR may not return to the alarm recording mode when the power comes back on.

After a power failure

If a power failure occurs during manual, timer or alarm recording, the VCR will return to the recording mode when the power comes back on. The Power Failure symbol (X) will be displayed for about 1 minute on screen and the Power Loss indicator (PL) will illuminate on the fluorescent display when the power comes back on. If a power failure occurs while the VCR's power is on, the VCR will turn on by itself when the power comes back on.

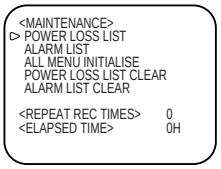


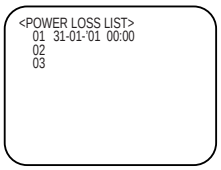
Displaying/clearing the power loss list

■ Displaying the power loss list

The power failure start time is logged in the VCR's Power Loss List. To view the list, please follow the steps listed below.

1. Press **MENU** button.
   - **<MAIN MENU>** appears.
2. Turn **JOG** to select **MAINTENANCE** and turn **SHUTTLE** to the right.
   - **<MAINTENANCE>** menu appears.
3. Turn **JOG** to select **POWER LOSS LIST** and turn **SHUTTLE** to the right.
   - **<POWER LOSS LIST>** appears.
4. Press **MENU** button.
   - The day and present time appears on screen.



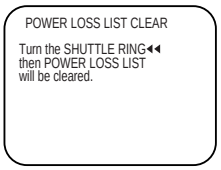


Note

- Up to 3 power failure start times will be displayed. If more than 3 failures have occurred, the first start time and the last 2 start times will be displayed on the list.

■ Clearing the power loss list

1. Select **POWER LOSS LIST CLEAR** in **<MAINTENANCE>** menu and turn **SHUTTLE** to the right.
2. Turn **SHUTTLE** to the left to clear the list.
   - **<MAINTENANCE>** menu appears.
   - ⇨ To exit the menu without clearing the list, press **MENU** button.
3. Press **MENU** button.
   - Once the list is cleared, the Power Loss indicator (PL) will go off.

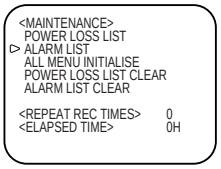


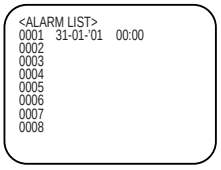
Displaying/clearing the alarm list

■ Displaying the alarm list

The alarm recording start time are logged in the VCR's Alarm List. To view the list, please follow the steps listed below.

1. Press **MENU** button.
   - **<MAIN MENU>** appears.
2. Turn **JOG** to select **MAINTENANCE** and turn **SHUTTLE** to the right.
   - **<MAINTENANCE>** menu appears.
3. Turn **JOG** to select **ALARM LIST** and turn **SHUTTLE** to the right.
   - **<ALARM LIST>** appears.
4. Press **MENU** button.
   - The day and present time appears on screen.



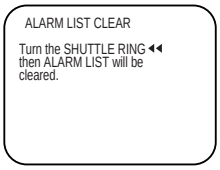


Note

- Maximum of 9,999 alarm recording start times will be counted.
- Up to 8 alarm recording start times will be displayed. If more than 8 alarm recordings have occurred, the first start time and the last 7 start times will be displayed on the list.

Additional Features (Cont.)

■ Clearing the alarm list



1. Select **ALARM LIST CLEAR** in **<MAINTENANCE>** menu and turn **SHUTTLE** to the right.
2. Turn **SHUTTLE** to the left to clear the list.
   - **<MAINTENANCE>** menu appears.

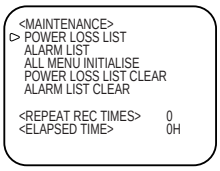
   ⇨ To exit the menu without clearing the list, press **MENU** button.
3. Press **MENU** button.
   - Once the list is cleared, the Alarm Recording indicator (ALARM) on the fluorescent display will go off.

Tape usage and elapsed time of VCR

REPEAT REC TIMES indicates how many times a tape has been recorded over since it was first inserted.

ELAPSED TIME indicates the total time the VCR has been used for recording or playback.

1. Press **MENU** button.
   - **<MAIN MENU>** appears.
2. Turn **JOG** to select **MAINTENANCE** and turn **SHUTTLE** to the right.
   - **<REPEAT REC TIMES>** and **<ELAPSED TIME>** are shown at the bottom of the **<MAINTENANCE>** menu.
3. Press **MENU** button.
   - The day and present time display appears on screen.



Note

- <REPEAT REC TIMES> are:
  - counted when the tape ends during recording (except when TAPE END of FIRST TIME SET UP menu is set to STOP).
  - memorized even if the VCR is turned off.
  - reset when a tape is inserted.
  - shown up to a maximum figure of 200, beyond which the display will show OVER.
- <ELAPSED TIME> is shown up to 89,999 hours.

Lock function

Each time the **LOCK** button is pressed, the Lock/Lock All indicator illuminates on the fluorescent display in the order of LOCK → LOCK A → (No display) → LOCK → ... All or some of the buttons on the front panel of the VCR are locked, and the VCR is kept in the current condition. To release the lock, press **LOCK** button until nothing is displayed on the fluorescent display.

LOCK : All buttons except REC button and EJECT button are locked.

LOCK A : All buttons are locked.

(No display): No buttons are locked.

Note A point to notice Info. Supplementary information

Special Effects Playback

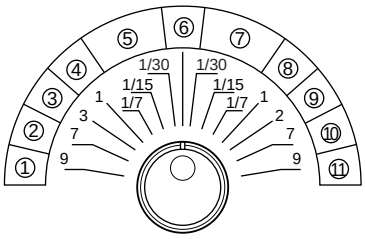
The following convenient functions are available. Audio output is muted during special effects playback.

Still picture

1. Press **PAUSE** button during playback.
   - Press **PAUSE** button again to resume the playback.

Shuttle ring

By turning the SHUTTLE ring during still picture, you can obtain a variety of playback as shown below.



1 Reverse high speed search
2 Reverse speed search
3 Reverse fast playback (x3)
4 Reverse playback
5 Reverse slow
6 Still
7 Slow playback
8 Normal playback
9 Fast playback (x2)
10 Forward speed search
11 Forward high speed search

1. Turn **SHUTTLE** to the right or left during still picture.
   - The playback speed varies by the angle of **SHUTTLE** ring.
   - When **SHUTTLE** ring is released, it comes back to the centre position and the playback picture stays at still.

Shuttle hold

When the SHUTTLE ring is released, the playback speed can be fixed to one selected.

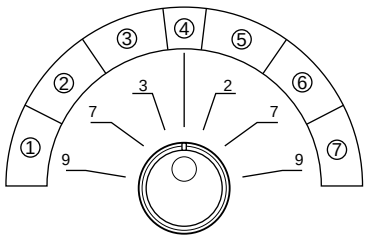
1. Turn **SHUTTLE** to the right or left to obtain a desired playback speed, then press **PAUSE** button.
2. Release **SHUTTLE**.

■ Cancelling the shuttle hold playback

1. Press **PAUSE** button once to go back to the still picture and press once again to return to the playback.

Direct shuttle ring

By turning the SHUTTLE ring during playback, you can obtain some of special effects playback as shown below.



1 Reverse high speed search
2 Reverse speed search
3 Reverse fast playback (x3)
4 Normal playback
5 Fast playback (x2)
6 Forward speed search
7 Forward high speed search

Frame or field playback

1. To forward frames or fields one by one, turn **JOG** during still picture.
   - Turn to the right to forward.
   - Turn to the left to reverse.

   To forward frames or fields continuously, keep turning **JOG** during still picture.
   - Keep turning to the right to forward frames (fields) continuously.
   - Keep turning to the left to reverse frames (fields) continuously.

   To stop frame or field playback, release **JOG**.
   - The playback picture stays at still.

Note

- A few noise bars or vertical movement may appear during frame or field playback.
- Noise bars may appear on the picture while switching between forward and reverse frame or field playback.

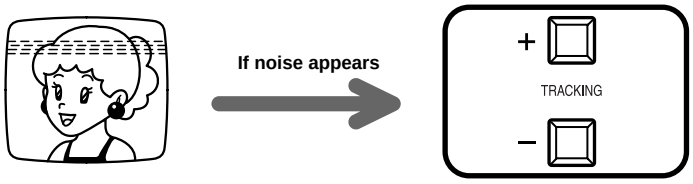
Adjustment during Playback

Tracking adjustment

If noise appears in the picture during playback, reverse/forward slow playback, fast playback, reverse playback or frame/field playback, you can reduce or eliminate it by adjusting the tracking.

■ How to adjust during playback

1. Press **TRACKING** button **(+)** or **(–)** to achieve the best picture.



■ How to adjust during reverse/forward slow playback, fast playback, reverse playback, frame or field playback

1. During still picture, turn **SHUTTLE** to obtain the respective playback mode.
   ⇨ If noise appears in frame or field playback, set to slow playback.
2. While turning **SHUTTLE**, press **PAUSE** button.
   - The playback picture is fixed at the selected speed.
3. Release **SHUTTLE**.
4. Press **TRACKING** button **(+)** or **(–)** to achieve the best picture.

■ Initialising the tracking

The tracking will be set to its initial setting by pressing both **TRACKING** buttons **(+)** and **(–)** together during playback.

Note

- Adjust the tracking at each playback mode or the type of playback (fast playback, reverse playback etc.), since the method of tracking adjustment varies.
- Although the tracking is adjusted during reverse playback or reverse slow playback, the noise may remain on screen.
- When a picture recorded in 3H or 4H mode is played back in L12H, L16H, L24H or L32H mode, noise may appear on screen after the adjustment.
- The noise bars will move continuously when a **TRACKING** button is depressed.

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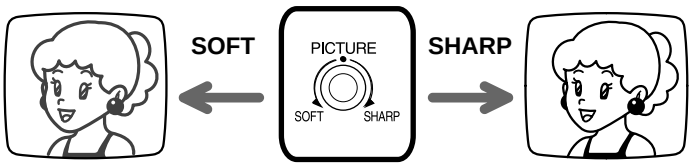
Adjustment during Playback (Cont.)

Picture quality adjustment

This control allows you to adjust the playback picture so that the outline is sharper or softer.

1. During playback, turn **PICTURE** control to the right or left.
   - Turning to the right makes the picture sharper.
   - Turning to the left makes the picture softer.

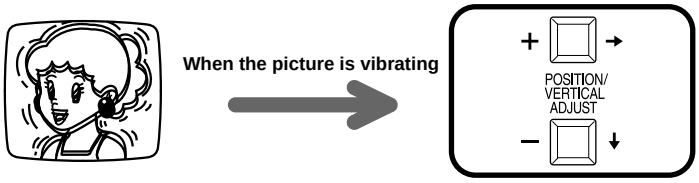


Vertical adjustment (picture vibration at the top and bottom)

The picture vibration during still picture, fast playback or playback at L12H-224H or 0H mode can be reduced or eliminated by the following steps.

■ How to adjust

1. Press **PAUSE** button during playback.
2 Press **VERTICAL ADJUST** button **(+)** or **(–)** to reduce or eliminate the picture vibration.



■ Initialising the vertical adjustment

The vertical adjustment will be reset to its initial setting by pressing both **VERTICAL ADJUST** buttons **(+)** and **(–)** together during still picture or playback at L12H-224H or 0H mode.

Note

- Horizontal vibration cannot be corrected with **VERTICAL ADJUST** buttons.
- **VERTICAL ADJUST** buttons will not work when QUASI V-SYNC of FIRST TIME SET UP menu is set to OFF.
- The picture vibration during still picture, frame of field playback may not be adjusted with the **VERTICAL ADJUST** buttons.

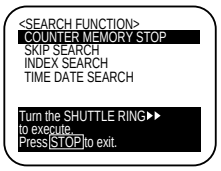
Searching Techniques

The various search functions help you to find pictures you wish to view.

Counter memory stop

Rewinds a tape until the counter on the fluorescent display reaches “00000” and stops.

1. Press **SEARCH** button once.
   - **<SEARCH FUNCTION>** menu appears and **COUNTER MEMORY STOP** is highlighted.
   - The Counter Memory Stop indicator (**M**) illuminates on the fluorescent display.



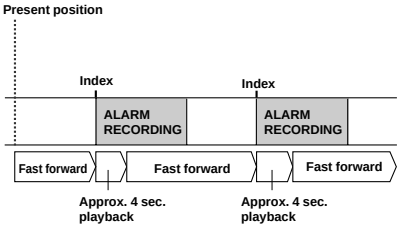
2. Turn **SHUTTLE** to the right.
   - The VCR starts rewinding the tape.
   ⇨ To quit while rewinding, press **STOP** button.
   ⇨ To exit the **<SEARCH FUNCTION>** menu without rewinding, press **STOP** button.

Note

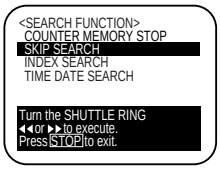
- When the counter on the fluorescent display indicates “00000”, COUNTER MEMORY STOP on the SEARCH FUNCTION menu cannot be selected.

Skip search

During fast forwarding or rewinding, the VCR plays back a tape (at 3H or 4H mode) for about 4 seconds where an index signal is recorded. This process is repeated until the end or beginning of the tape is reached.



1. Press **SEARCH** button until **SKIP SEARCH** is highlighted.
   - The Skip Search indicator (**SKIP**) illuminates on the fluorescent display.



2. Turn **SHUTTLE** to the right or left.
   - Turning to the right proceeds the search in the forward direction.
   - Turning to the left proceeds the search in the reverse direction.
   ⇨ To quit while searching, press **STOP** button.
   ⇨ To exit the **<SEARCH FUNCTION>** menu without searching, press **STOP** button.

3. When you find a picture you wish to view, press **PLAY** button.

Note

- The index signal may be difficult to locate in some recording conditions.
- Audio output is muted during the skip search.

Info.

- Skip search or index search may not function if the interval between two alarm recording start-times is too short. The table below indicates the minimum interval between two alarm recording start-times for the skip or index search to work correctly.

Alarm recording mode	Minimum interval between two alarm recording start-times
3H(4H)	approx. 15 sec.
L12H(L16H)	approx. 2 min.
L24H(L32H)	approx. 2 min.

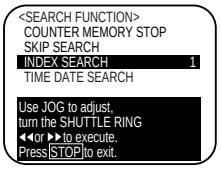
( ) appears when TAPE LENGTH is set to E-240.

Note A point to notice Info. Supplementary information

Index search

During fast forwarding or rewinding, the VCR will search for an index signal you have selected. When the index signal is found, the VCR will play back in still picture.

1. Press **SEARCH** button until **INDEX SEARCH** is highlighted.
   - The Index Search indicator (**INDEX**) illuminates on the fluorescent display.



2. Turn **JOG** to select an index number (between 1 and 255) you wish to find.
   ⇨ To exit the **<SEARCH FUNCTION>** menu without searching, press **STOP** button.

3. Turn **SHUTTLE** to the right or left to start searching.
   - Turning **SHUTTLE** to the right performs the search in the forward direction.
   - Turning **SHUTTLE** to the left performs the search in the reverse direction.
   - The index number shown on the fluorescent display will decrease one by one as each index signal goes by.

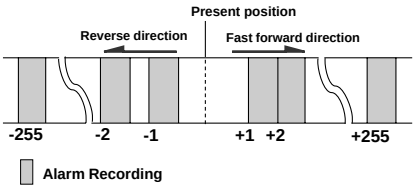
   ⇨ To quit while searching, press **STOP** button.

Note

- The index signal may be difficult to locate in some recording conditions.

Info. How to count index number

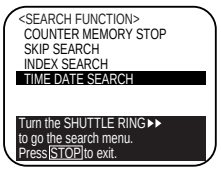
- Index number is the count from the present position. The index number of one alarm recording before the present position is “-1”. One after is “+1”.
- Maximum count is ±255 alarm recordings.



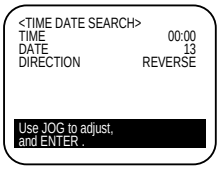
Time date search

You can easily find a picture recorded at specific date and time.

1. Press **SEARCH** button until **TIME DATE SEARCH** is highlighted.
   - The Time Date Search indicator (**D**) illuminates on the fluorescent display during search.

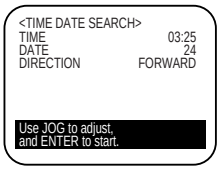


2. Turn **SHUTTLE** to the right.
   - **<TIME DATE SEARCH>** menu appears.



3. Turn **JOG** to set *hour digits* of **TIME** you wish to find and turn **SHUTTLE** to the right.
   ⇨ To exit the **<TIME DATE SEARCH>** menu without searching, turn **SHUTTLE** to the left several times.

4. Set *10-minute digit* and *1-minute digit* of **TIME**, **DATE** and **DIRECTION** in a similar fashion.
   - Searches in the forward direction of the tape when DIRECTION is set to FORWARD.
   - Searches in the reverse direction of the tape when DIRECTION is set to REVERSE.



5. Turn **SHUTTLE** to the right to start searching.
   - When the recorded picture is found, it is shown at still picture.

   ⇨ To quit while searching, press **STOP** button.

Note

- An index mark is written on a tape at each hour (1:00, 2:00 and so on) during recording. The time date search cannot be resumed if the index mark of the hour (set in step 3) is not recorded on a tape.
  Example: When the VCR recorded from 8:15 to 17:30 on a tape, only pictures recorded between 9:00 and 17:30 can be found using the time date search.
- The time date search may not function correctly, if you use a tape with a poor recording quality or with alarm recordings recorded at several recording modes.
- The time date search will not function when using a tape recorded with other VCRs or a tape recorded without the current day and time.

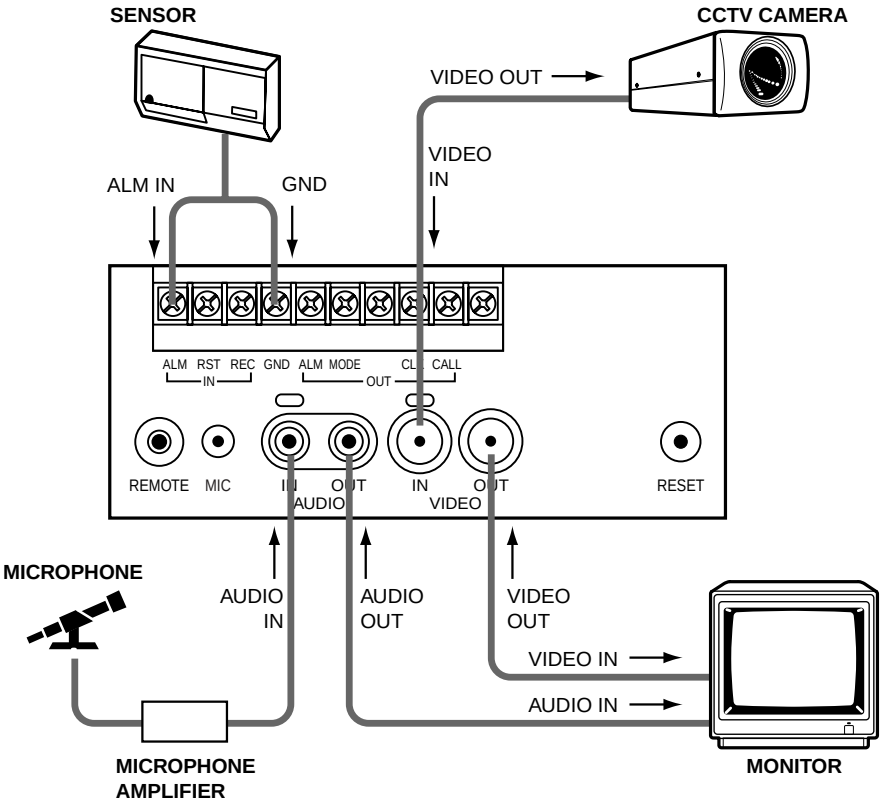
Info.

- When the desired part of the tape is not found in the selected direction, the VCR automatically searches in the opposite direction.

ENGLISH

Connections for Various Functions

Connecting with CCTV camera, monitor and sensor

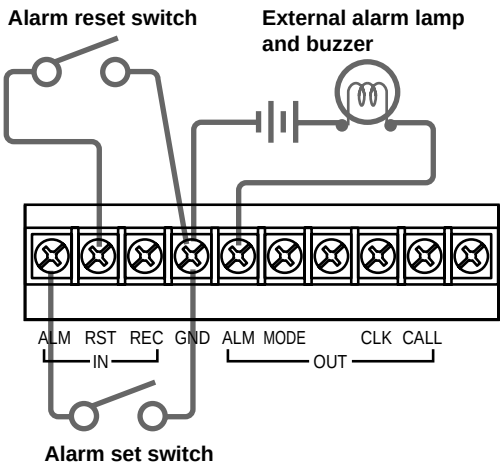


Note

- Monitor to be connected
  - Connecting with a CCTV monitor (for surveillance) is recommended.
  - Connecting with some monitors may cause picture vibration and/or picture distortion at the top or bottom of the image at still picture or normal playback.
  - A television for domestic use may easily cause picture vibration and distortion.
- CCTV camera to be connected
  - Do not connect ‘Colour’ and ‘Black & White’ cameras together.

Alarm Recording Connection

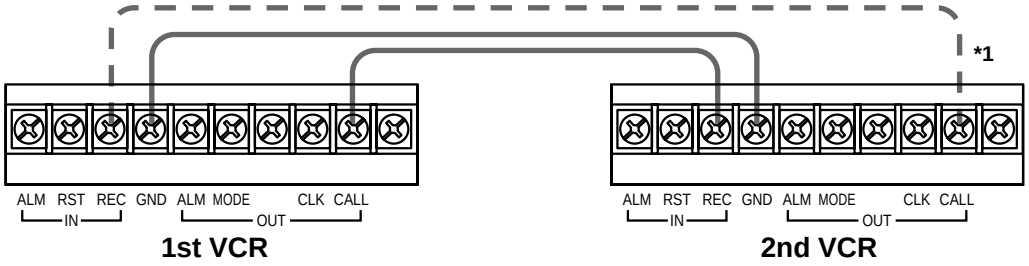
The alarm can be confirmed from a distance by connecting the ALM OUT terminal with an existing alarm system panel or other peripherals such as a buzzer. Connect the VCR and other peripherals as shown below. (☞ page 12 for the menu setting)



Note A point to notice Info. Supplementary information

Series Recording Connection

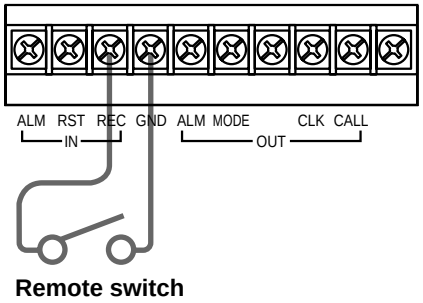
Connect VCRs to be used as shown below. (☞ page 13 for the menu setting)



1** : This connection is necessary in case of ***Series Recording 2.

Remote Recording Connection

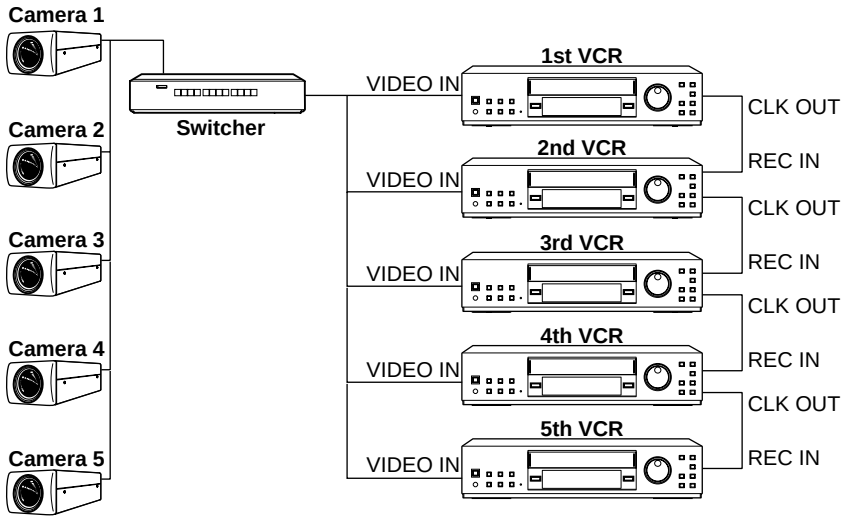
Connect the VCR with a remote switch as shown below. (☞ page 13 for the menu setting)



Synchronous Recording Connection

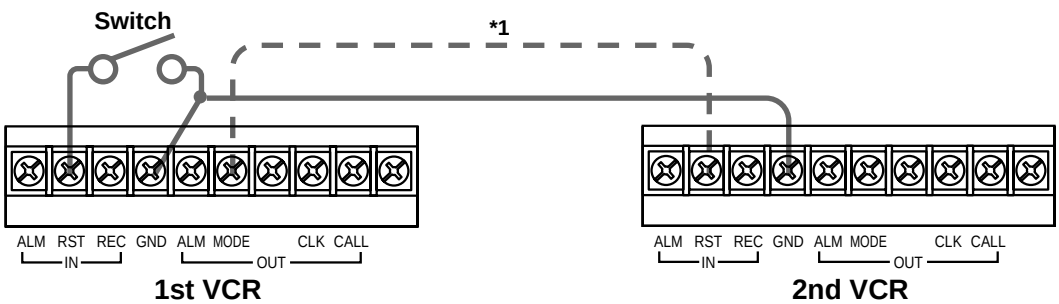
Connect VCRs as shown below. (☞ page 14 for the menu setting)

Note The number of VCRs to be connected varies by the recording time mode selected.



Connection for External Time Clock Adjustment

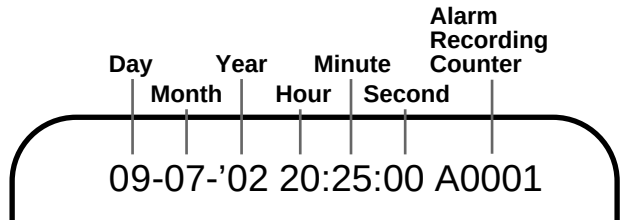
Connect VCRs as shown below. (☞ page 22 for the menu setting)



***1** : When connecting the MODE OUT terminal of the first VCR with the RST IN terminal of the second VCR, the on-screen clock of the second VCR can be adjusted to that of the first VCR.

Setting the Clock

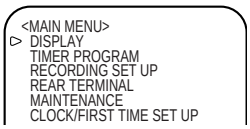
Accurately set the day and present time before timer programming.



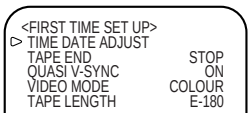
- '02 indicates year 2002.
- The clock is shown in 24-hour format.
- Alarm recording counter is shown during alarm recording only.

Example : Setting the day and present time to 8:25 p.m., 9 July, 2002.

1. Press **MENU** button.
   - **<MAIN MENU>** appears.

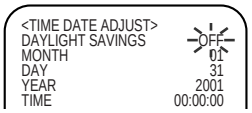


2. Turn **JOG** to select **CLOCK/FIRST TIME SET UP** and turn **SHUTTLE** to the right.
   - **<FIRST TIME SET UP>** menu appears.



3. Turn **JOG** to select **TIME DATE ADJUST** and turn **SHUTTLE** to the right.
   - **<TIME DATE ADJUST>** menu appears.

4. Turn **JOG** to set **DAYLIGHT SAVINGS** and turn **SHUTTLE** to the right.

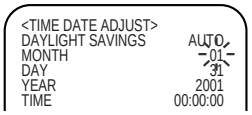


   - When set to **ON**, the clock moves forward one hour.
   - When set to **AUTO**, the clock moves forward one hour from the last Sunday of March (at 1 a.m.) to the last Sunday of October (at 2 a.m.).
   - When set to **ON** or **AUTO** and the clock is put forward one hour, the Daylight Saving Time symbol (☀) is shown next to the hour digit of **TIME** on screen and the Daylight Saving Time indicator (▮) illuminates on the fluorescent display.

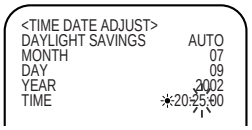
Note

- When the DAYLIGHT SAVINGS is set to AUTO, the programmed recordings starting or finishing in the daylight saving time changeover period may not be recorded correctly.
- The daylight saving time may vary from the one above depending on your region or the year, in this case, set DAYLIGHT SAVINGS to ON or OFF manually.

5. Turn **JOG** to show "**07**" for **MONTH** and turn **SHUTTLE** to the right.



6. Set **DAY**, **YEAR**, **TIME** (hour digits, 10-minute digit and 1-minute digit) in a similar fashion.



7. Turn **SHUTTLE** to the right while the 1-minute digit of **TIME** is flashing.
   - The setting is now complete.
   - **<FIRST TIME SET UP>** menu appears.

8. Press **MENU** button.
   - The day and present time display appears on screen.

Info.

- **When DAYLIGHT SAVINGS is set to ON or OFF and a tape is not inserted in the VCR, DAYLIGHT SAVINGS can be switched to ON or OFF on the front panel of the VCR by pressing STOP button and EJECT button together.**
- To move the displayed position of the day and present time on screen, press **POSITION** button **(→)** or **(↓)**. **(→)** moves the display in a right-forward direction and **(↓)** in a downward direction.

Setting the current time to exact second

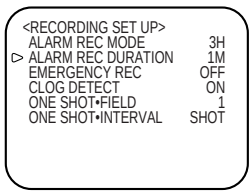
Set the clock as described above, but set minute digits to one or two minutes ahead of the reference time being used. When the reference time reaches 00 seconds of the minute you have set, turn **SHUTTLE** to the right. The VCR's clock now corresponds to the reference time to the nearest second.

External time clock adjustment

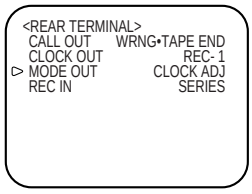
The VCR's clock can be set to the nearest hour by connecting with an external clock. When 2 or more VCRs are connected together, the clock can be set to the 1st VCR's clock simultaneously. Make the following settings to all VCRs you wish to set the clock. (☞ previous page for the connection)

1. Press **MENU** button.
   - **<MAIN MENU>** appears.

2. Set **ALARM REC DURATION** of **<RECORDING SET UP>** menu to other than **MAN1**.



3. Set **MODE OUT** of **<REAR TERMINAL>** menu to **CLOCK ADJ**.



4. Press **MENU** button.
   - The day and present time display appears on screen.

■ How the external time clock adjustment works

When the RST IN terminal is grounded at the rear panel, the clock is automatically set to the nearest hour.

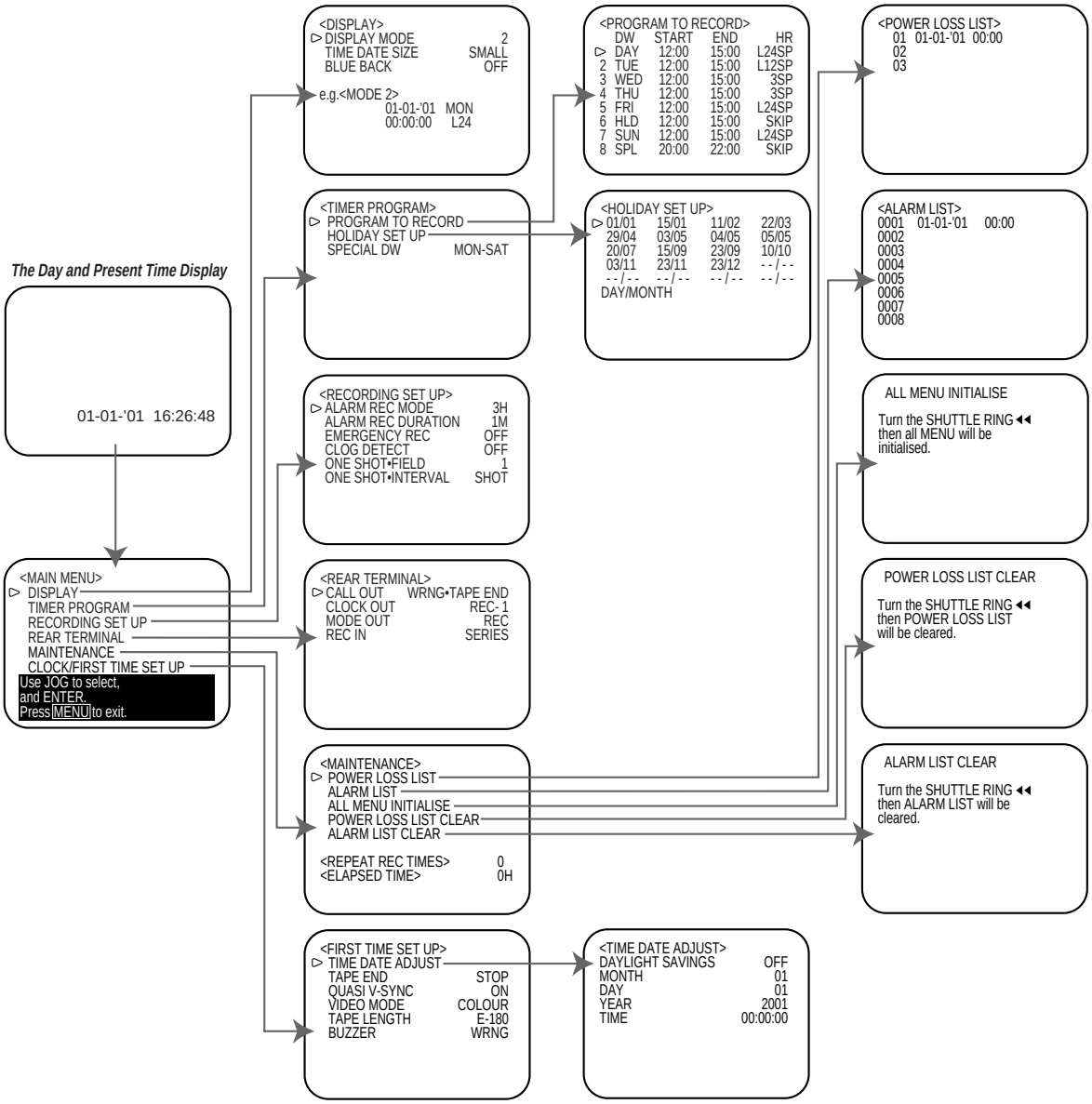
Example)

- When the display shows 11:29:59, the clock is adjusted to 11:00:00.
- When the display shows 11:30:00, the clock is adjusted to 12:00:00.

When more than 2 VCRs are connected and the clock of the 1st VCR is adjusted to the nearest hour, the additional VCRs will also be set to the nearest hour.

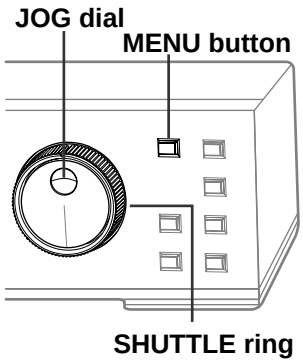
Setting the Menus

Menu Chart



Set the menus by the following steps.

1. Press **MENU** button.
   - **<MAIN MENU>** appears.
2. Turn **JOG** to the left or right to select the desired item.
   - When turned to the right, the cursor moves downward.
   - When turned to the left, the cursor moves upward.
3. Turn **SHUTTLE** to the right.
   - The desired item is selected and the menu appears.
4. Turn **JOG** to the left or right to select item.
5. Turn **SHUTTLE** to the right, then the setting item flashes.
6. Turn **JOG** to the left or right to change the setting.
7. Turn **SHUTTLE** to the right to set.
8. Press **MENU** button.
   - The day and present time display appears.

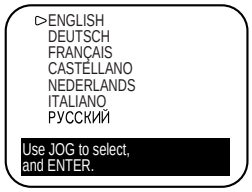


Setting the Menus (Cont.)

LANGUAGE SELECTION

The menu which appears on screen offers 7 languages.
This menu appears by pressing MENU button, when the VCR is turned on for the first time after the purchase or when RESET button is pressed during use.

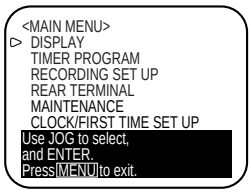
1. Press **MENU** button.
   - The menu as shown to the right appears.
2. Turn **JOG** to select the desired language.
3. Turn **SHUTTLE** to the right.
   - **<MAIN MENU>** in the selected language appears on screen.
4. Press **MENU** button to exit.



Note

- After first time setup and selection of the language to be used, the only way to go back and access the main menu in the seven languages is to PRESS the **RESET** button found on the rear panel. The **RESET** button can be accessed with a small pointed object. The **RESET** button is pressed, repeat steps 1 to 4 above.

MAIN MENU



DISPLAY
Sets the display format of the date and present time on screen.

TIMER PROGRAM
Sets the timer recording.

RECORDING SET UP
Sets the alarm recording mode, alarm recording duration and emergency recording, etc.

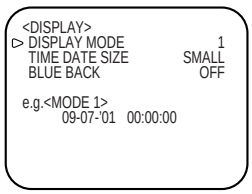
REAR TERMINAL
Sets the frequency division ratio of CLOCK OUT, output signal of CALL OUT terminal and MODE OUT terminal, etc.

MAINTENANCE
Displays the power loss list and alarm list, etc. Also, initialises all menu settings, clears the power loss list and alarm list.

CLOCK/FIRST TIME SET UP
Sets the present time and the operation at the tape end, etc.

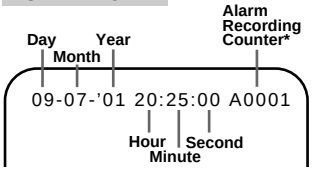
DISPLAY

Setting the display mode (DISPLAY MODE)

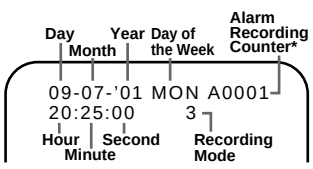


1 : Shows date and present time.
2 : Shows date, day of the week, present time and recording mode.
3 : Displays nothing. In case of alarm recording, displays same items as DISPLAY MODE 2.
4 : No date or time display.

DISPLAY MODE 1



DISPLAY MODE 2 and 3



* shown when DISPLAY MODE 1, 2 or 3 is selected.

Setting the size of letter for date and present time display (TIME DATE SIZE)

SMALL : The size of the letters become small.
LARGE : The size of the letters become large.

Setting the background colour (BLUE BACK)

ON : The blue coloured screen overlays on the recorded picture when the menu is displayed on the monitor.
OFF : The recorded picture is overlaid with the menu display.

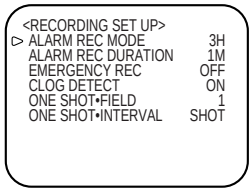
Note

- When the setting is OFF and the video signal is not input, the blue coloured screen overlays on the recorded picture when the menu is displayed on the monitor.
- When the setting is ON and the video signal is not input, the background colour will be in blue. In this case, the warning "NO SIGNAL" flashes on screen and "noSIg" flashes on the fluorescent display.

TIMER PROGRAM

☞ page 11, **Timer Recording**.

RECORDING SET UP



Setting the alarm recording mode (ALARM REC MODE)
Sets the alarm recording time mode.

- Providing TAPE LENGTH in FIRST TIME SET UP menu is set to E-180.
  When JOG is turned, the display will be switched in the order of 3H → L12H → L24H → 3H → ...
- Providing TAPE LENGTH in FIRST TIME SET UP menu is set to E-240.
  When JOG is turned, the display will be switched in the order of 4H → L16H → L32H → 4H → ...

Setting the alarm recording duration (ALARM REC DURATION)
Sets the duration of the alarm recording period. When JOG is turned, the display will be switched in the order of 1M (minute) → 2M → 5M → 10M → MAN1 → MAN2 → 15S (second) → 30S → 45S → 1M → ...

Setting the emergency recording (EMERGENCY REC)

ON : Starts alarm recording when the ALM IN terminal is grounded while the VCR is recording, in stop mode, turned off or in stand-by mode for timer recording.
OFF : Starts alarm recording when the ALM IN terminal is grounded during recording.

Setting the clog detection (CLOG DETECT)

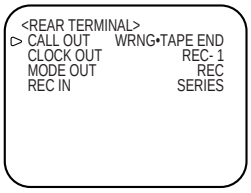
ON : The VCR automatically removes any particles that may accumulate on the heads during time-lapse recording. If it cannot be entirely removed, a warning "CLOg" flashes on the fluorescent display (☞ page 30).
OFF : The VCR does not detect clogged head.

Setting the number of fields in one shot recording (ONE SHOT•FIELD)
Sets the number of recorded fields in the one shot recording mode. When JOG is turned, the display will be switched in the order of 1 → 2 → 3 → 4 → 5 → 10 → 20 → 30 → 1 → ...

Setting the interval time in the one shot recording (ONE SHOT•INTERVAL)
Sets the interval time in the one shot recording mode. When JOG is turned, the display will be switched in the order of SHOT → 10S (second) → 15S → 30S → 45S → 1M (minute) → 2M → 3M → SHOT → ...

Note A point to notice Info. Supplementary information

REAR TERMINAL



Setting the operation mode of the CALL OUT terminal (CALL OUT)
Sets the mode of call signal output from the CALL OUT terminal. If any abnormalities occur with the VCR during recording, the call signal is output from the CALL OUT terminal on the rear panel regardless of CALL OUT setting.

WRNG•TAPE END : The VCR outputs a call signal when the tape reaches its end or when a malfunction occurs. The VCR's function when the tape ends depends on the setting of TAPE END in FIRST TIME SET UP menu (☞ next column).

WRNG•REMAIN : The VCR outputs a call signal when a malfunction occurs or when the tape has approximately 3 minutes (at 3H mode) left.

WRNG : The VCR outputs a call signal only when a malfunction occurs.

Setting the recording mode and frequency division ratio (CLOCK OUT)
Sets the recording mode and the frequency division ratio of clock pulse output from the CLOCK OUT terminal.

- Setting the recording mode during the clock pulse output

REC : When recording in any mode.

T/L REC : When recording in time-lapse mode (L12H-224H or 0H).

- Setting the frequency division ratio of the clock pulse output.

When JOG is turned, the display will be switched in the order of 1 → 2 → 3 → 4 → 5 → 10 → 15 → 20 → 25 → 30 → 50 → 60 → F (field) → 1 → ...
The numbers 1 to 60 indicate the number of frames at 3H or 4H recording mode and the number of fields at time lapse recording modes. (One frame consists of two fields.) When set to F (field), one field is selected.

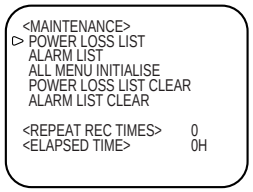
Setting the operation mode of the MODE OUT terminal (MODE OUT)
A mode signal is output under the following circumstances.

REC : During recording.
PLAY : During playback.
POWER : While the VCR is turned on.
TAPE IN : When a tape is inserted in the VCR.
TAPE REMAIN : When the tape has approximately 3 minutes (at 3H mode) left.
CLOCK ADJ : When the clock indicates "00(min.):00(s)". (The signal is output for 1 second only.)

Setting the operation mode of REC IN terminal (REC IN)

SERIES : Recording starts when the signal is input.
REC-START/STOP : Recording continues while the signal is input. If the signal is input for a short period, the VCR may not start recording.
SYNC REC : The video signal from the multiple of 5 or 9 cameras can be recorded separately by connecting a switcher (☞ page 14 for the menu setting and page 21 for the connection).

MAINTENANCE

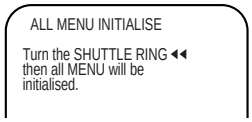


Displaying the power loss list (POWER LOSS LIST)
☞ page 15

Displaying the alarm list (ALARM LIST)
☞ page 15

Initialising all menu settings (ALL MENU INITIALISE)
All menus will be initialised except timer programs.

1. Press **MENU** button.
   - **<MAIN MENU>** appears.
2. Turn **JOG** to select **MAINTENANCE** and turn **SHUTTLE** to the right.
   - **<MAINTENANCE>** menu appears.
3. Turn **JOG** to select **ALL MENU INITIALISE** and turn **SHUTTLE** to the right.
   - **<ALL MENU INITIALISE>** menu appears.



4. Turn **SHUTTLE** to the left.
   - The setting of all menus (except TIMER PROGRAM) will return to its initial setting.
   ⇨ To exit the menu without initialising all menus, press the **MENU** button.
5. Press **MENU** button.
   - The day and present time display appears on screen.

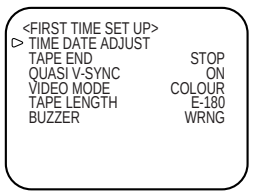
Clearing the power loss list (POWER LOSS LIST CLEAR)
☞ page 15

Clearing the alarm list (ALARM LIST CLEAR)
☞ page 16

Displaying number of tape use (REPEAT REC TIMES)
☞ page 16

Displaying the elapsed time of VCR (ELAPSED TIME)
☞ page 16

FIRST TIME SET UP



Setting the present time, date and Daylight Saving Time settings (TIME DATE ADJUST)
☞ page 22

Setting operation of VCR when the tape reaches its end during recording or playback (TAPE END)
The VCR's function when the tape reaches its end during recording is as follows:

STOP : The tape stops, the indication "End" appears on the fluorescent display and "TAPE END" on screen. When CALL OUT is set to WRNG•TAPE END, a call signal is output from the CALL OUT terminal.

REWIND : Rewinds the tape to the beginning and stops (except during timer recording). When CALL OUT is set to WRNG•TAPE END and a tape reaches its end, a call signal is output for 2 seconds from the CALL OUT terminal.

ENGLISH

Setting the Menus (Cont.)

REPEAT : Rewinds the tape to the beginning and resumes the recording. When CALL OUT is set to WRNG•TAPE END and a tape reaches its end, a call signal is output for 2 seconds from the CALL OUT terminal.

ALARM•PROT (alarm protection) :

If any alarm recordings are present on the tape and the tape stops, the indication “End” appears on the fluorescent display and “TAPE END” on screen. When CALL OUT is set to WRNG•TAPE END, a call signal is output from the CALL OUT terminal. If there is no alarm recording, the VCR rewinds the tape to the beginning and resumes the recording.

☞ Go to page 9 for the VCR’s function when the tape reaches its end during playback.

Setting Quasi-V-sync on or off (QUASI V-SYNC)

ON : Quasi-V-sync. signal is inserted to the video output signal in the special effects playback (☞ page 17) or normal playback in L12H-224H or 0H mode.

OFF : Quasi-V-sync. signal is not inserted.

Note

- Some multiplexers may require QUASI V-SYNC to be OFF in order to work properly.

Setting the playback/recording colour mode (VIDEO MODE)

AUTO : The VCR automatically switches the circuits according to type of the input/playback video signal, colour or black & white.

B/W : Select for recording or playback in black & white.

COLOUR : Select for recording or playback in colour.

Setting the tape length (TAPE LENGTH)

E-180 : Select when using a E-180 tape.

E-240 : Select when using a E-240 tape.

Setting to sound buzzer during warning (BUZZER)

WRNG : The buzzer sounds when there is any malfunction in the VCR.

WRNG•TAPE END : The buzzer sounds when there is any malfunction in the VCR or the tape reaches its end.

WRNG•REMAIN : The buzzer sounds when there is any malfunction in the VCR or the tape has approximately 3 minutes (at 3H mode) left.

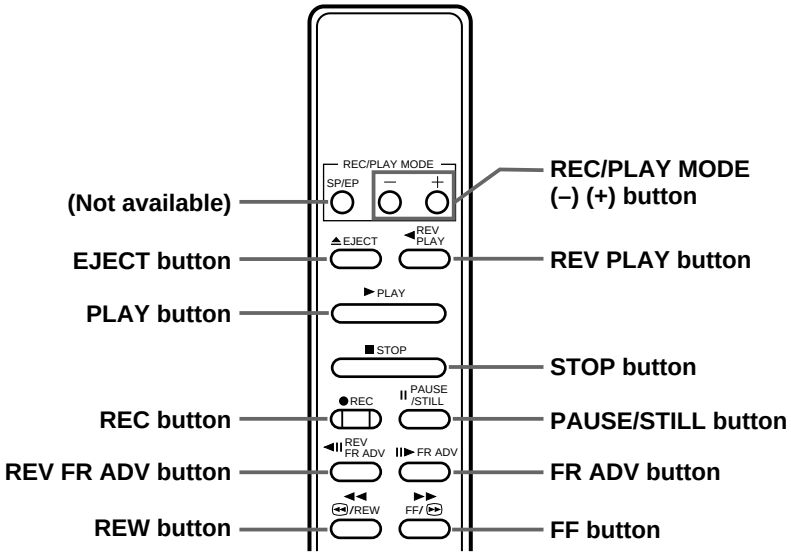
OFF : The buzzer does not sound.

Note

- **To stop the buzzer:**
  Press **MENU** button once. If <MAIN MENU> appears, press **MENU** button again to exit the menu. When the VCR is locked, press **LOCK** button to unlock the VCR, then the buzzer stops.

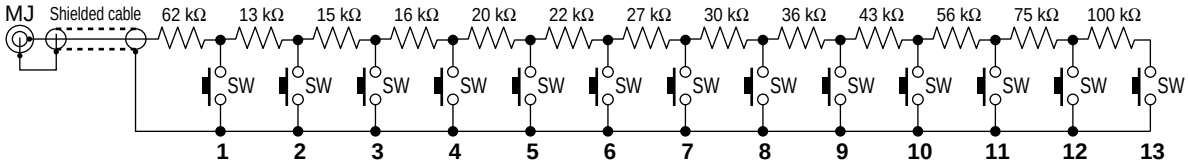
Remote Controller (Optional)

The optional remote controller (R-9100) provides remote operation of the VCR. Connect to the REMOTE terminal at the VCR's rear panel before use.



Remote Jack

■ Circuit



1) Resistor : Metal film resistor 1/4 W, resistance tolerance ± 1%
Temperature factor ± 100 PPM/°C
2) Button switch : Momentary, On resistor 200Ω or under
3) Connector MJ : Miniature jack, 2.5 mm in diameter, comply with JISC6560

■ Operational conditions

1) Isolation resistor : 200 MΩ or over (in connector MJ)
2) Floating capacity : 0.1 µF or under (in connector MJ)
3) Environmental temperature : 5-40 °C (common with VCR)
4) Relative temperature : Max. 80 % (common with VCR)

■ Remote control switch functions

Position	Function	Position	Function
1	EJECT	9	FORWARD FRAME SHIFT
2	STOP	10	REVERSE FRAME SHIFT
3	RECORDING	11	(+) REC/PLAY MODE
4	PAUSE	12	(–) REC/PLAY MODE
5	PLAYBACK	13	(Not available)
6	REVERSE PLAYBACK		
7	FAST FORWARD		
8	REWIND		

Before Calling for Service

When you find any problem with this VCR, first check the following. If you still cannot solve the problem, stop using the VCR, unplug it from an outlet and contact your dealer.

Symptom	Remedy
Installation	
No power supplied to VCR.	• Has the power cord been disconnected from the outlet? • Is the Lock or Lock All indicator (LOCK/LOCK A) illuminated? → Press LOCK button on the front panel several times to unlock the VCR. • Is the Timer Recording indicator (⏲) illuminated? → Press TIMER REC button on the front panel to cancel the timer recording.
The VCR POWER is ON but the VCR does not operate.	• Is the Lock or Lock All indicator (LOCK/LOCK A) illuminated? → Press LOCK button on the front panel several times to unlock the VCR. • Safety devices in are operation. → Press RESET button on the rear panel using a pointed instrument, then turn the power on again.
No picture is obtained on the MONITOR screen.	• Is the monitor or the camera connected correctly? → Check the connection. • Is the connecting cable properly connected, or is the cable defective? → Check the connection and also check the snapping of a wire in the cable.
The picture is not clear on the monitor.	• Is the camera focused? → See the user's manual for your camera and focus the camera correctly.
Function/operation	
No operation when any tape operation button is pressed.	• Is the Lock or Lock All indicator (LOCK/LOCK A) illuminated? → Press LOCK button on the front panel several times to unlock the VCR. • Is a cassette inserted?
The present time is not correct even if using the VCR everyday.	→ Make sure the power cord is connected to the outlet for approximately 40 or more hours per week when using it everyday.
The power cord has been disconnected for less than 31 days but the present time has been reset.	→ Make sure the power cord is connected to the outlet for approximately 40 or more hours per week when using it everyday. • The reserved contents may be erased even within 31 days depending on the charging time of the power failure compensation circuit. → Set the present time setting again.
A tape cannot be loaded.	• Is the Lock All indicator (LOCK A) illuminated? → Press LOCK button on the front panel once to unlock the VCR.
Recording	
Recording does not work by pressing the REC button.	• Is the Lock All indicator (LOCK A) illuminated? → Press LOCK button on the front panel once to unlock the VCR. • Has the cassette's erasure prevention tab been broken off? → Load the cassette with its erasure prevention tab intact. • Has the tape run out? → Rewind the tape or load a new tape.
Recording cannot be stopped by pressing the STOP button.	• Is the Lock or Lock All indicator (LOCK/LOCK A) illuminated? → Press LOCK button on the front panel several times to unlock the VCR. • Is the VCR in timer recording mode (Timer recording indicator (⏲) is illuminating)? → Press TIMER REC button once.
Repeat recording does not work.	• Is the Repeat indicator (↻) illuminated? → Set TAPE END in the FIRST TIME SET UP menu to REPEAT or ALARM•PROT. When TAPE END in the FIRST TIME SET UP menu is set to ALARM•PROT, repeat recording does not work using a tape with an alarm recording. When a tape reaches its end during the alarm recording, the VCR rewinds the tape and stops (recording does not start again) even though TAPE END in the FIRST TIME SET UP menu is set to REPEAT.

Symptom	Remedy

Recording (continued)

Timer recording does not operate.	• Have the day and present time been set accurately? → Set the day and present time again. • Have the recording start time, recording end-time and the recording mode been set accurately? → Confirm the settings on the <PROGRAM TO RECORD>. • Is the Timer Recording indicator (⏎) illuminated? → If not, press TIMER REC button on the front panel to stand by the timer recording.
Alarm recording does not work.	• Is the external switch connected correctly? → Check the connection. • Is the Emergency Recording indicator (EMGCY) illuminated? → Set EMERGENCY REC in the RECORDING SET UP menu to ON.

Playback

No operation when the PLAY button is pressed.	• Is the Lock or Lock All indicator (LOCK/LOCK A) illuminated? → Press LOCK button on the front panel several times to unlock the VCR. • Is a cassette inserted? • Has the tape run out?
Noise bars in the picture during playback.	→ Adjust the tracking by pressing TRACKING button on the front panel.
Playback speed is fast or slow.	→ Adjust the playback speed by pressing REC/PLAY MODE buttons on the front panel.
The picture vibrates at the top and bottom when in still picture mode.	→ Adjust the picture by pressing VERTICAL ADJUST buttons on the front panel.
Clear camera pictures during recording but during playback the picture is not clear.	• The video heads may be clogged. → Clean the video heads by using the video head cleaning cassette available in most local retail store. If the picture is not clear after using the video head cleaning cassette, please consult your dealer.

Warning Display

Self-diagnostic function

This VCR uses a self-diagnostic function to detect an internal malfunction during recording. When a malfunction occurs in the VCR during recording, the indicator corresponding to each malfunction illuminates on the fluorescent display and/or on screen.

The type of malfunction corresponding to the indicator and countermeasures are given below.

Fluorescent display	Monitor	Cause	Remedy	To turn off the indicator
End	TAPE END	The tape ends during recording.	Rewind the tape or press the EJECT button.	Turn off the indicator on the fluorescent display and screen by pressing the EJECT button or rewinding the tape.
noSIg	NO SIGNAL	Lack of video signal input.	Check for loose connections.	When a video signal is restored or the recording mode is cleared, the indicator on the fluorescent display and screen turns off.
(the display starts flashing)	CHECK	Tape/deck trouble.	First, check the cassette. If there seems to be nothing wrong with the cassette, try the recording operation again. If the indicator "CHECK" is still displayed on the monitor, replace the cassette with a new one and try the operation again. If this does not clear the indicator, unplug the power cord and contact your dealer.	
CLOg	–	Clogged head.	Eject the cassette and insert it again. If the indicator "CLOg" is still displayed, clean the video cassette tape. If the VCR still shows the indicator after cleaning, contact your dealer.	When the recording mode is cleared, the indicator on the fluorescent display on screen turns off.

■ When the tape ends

When the tape reaches its end during recording, "End" illuminates on the fluorescent display and "TAPE END" illuminates on screen. The warning indicators will not illuminate, if TAPE END in FIRST TIME SET UP menu is set to REPEAT, ALARM•PROT (when no alarm recording is made) or REWIND.

■ Lack of video signal input

The indicator "NO SIGNAL" appears on screen and "noSIg" flashes on the fluorescent display when the VCR cannot get any video input signal during recording. The video input signal will not be obtained in case of any malfunction such as a broken video cable or POWER to the camera is turned off.

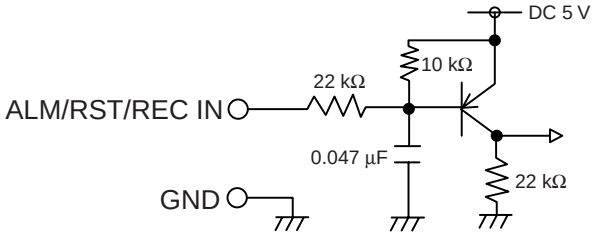
■ About fouling of the head (Clogged head)

When CLOG DETECT of the RECORDING SET UP menu is set to ON, the VCR automatically remove any particles that may accumulate on the heads during time-lapse recording mode. If it cannot be entirely removed, "CLOg" flashes on the fluorescent display. If so, follow the remedy of "CLOg" in the above chart.

Control Input/Output Signals and Circuit

ALM/RST/REC IN terminals (screw)

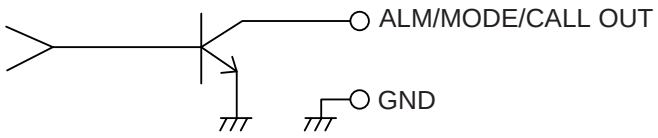
Active : When input terminals are short-circuited to GND or “L” level voltage (0 to + 1.6 V) applied.
Time for active : 0.1 sec. or over.
Non active : Open the input.



<Interface circuit inside the VCR>

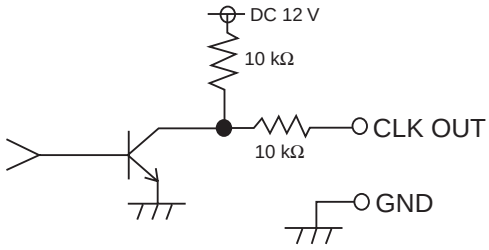
ALM/MODE/CALL OUT terminals (screw)

Active : “L” level voltage (0 to + 0.4 V) output; max. drive current 50 mA (+5 V DC)/10 mA (+24 V DC)
Non active : Open; max. voltage +24 V DC



<Interface circuit inside the VCR>

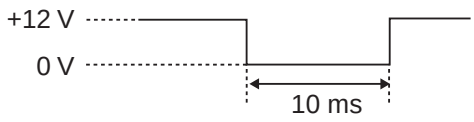
CLK OUT terminals (screw)



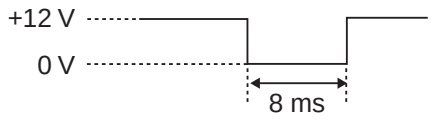
<Interface circuit inside the VCR>

CLK OUT signal

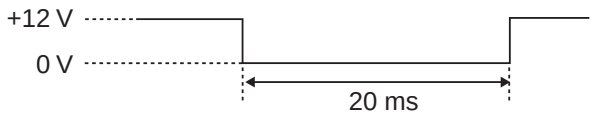
- When F is selected in CLOCK OUT of REAR TERMINAL menu (at 3H or 4H mode).



- During recording in L12H-224H or 0H mode.



- When REC-1 to REC-60 is selected in CLOCK OUT of REAR TERMINAL menu (at 3H or 4H mode).



Specifications

General

Power Source	: AC 100-230 V ± 10%, 50/60 Hz
Power Consumption	: Approx. 18 watts
Television System	: CCIR standard 625 lines, 50 field PAL-type colour system
Colour Signal	: Low frequency conversion, sub-carrier phase shift recording
Tape Format	: VHS 1/2” width high-density video cassette tape
Tape Speed and Recording Time	: See below (*1)
Fast Forward/Rewind Time	: Approx. 120 seconds with E-180 tape
Operating Temperature	: 41 °F to 104 °F (5 °C to 40 °C)
Relative Humidity	: Max. 80 %
Dimensions (Jog dial included)	: 16.7 (W) x 12.4 (D) x 3.7 (H) (in.) 425 (W) x 314 (D) x 95 (H) (mm)
Weight	: 9 lbs (4.2 kg)
Heads-Video	: 4 rotary heads
Luminance Signal	: Frequency modulation recording
Audio Track	: 1 track
Audio/Control	: 1 stationary head
Erase	: 1 full-track head
Motors	: 3 motors-drum/capstan direct drive system
Battery Backup	: Lasts 31 days

Audio

Input	: 308 mV (rms), 47 kΩ, RCA plug
Output	: 388 mV (rms), 1 kΩ, RCA plug
Signal-to-Noise Ratio	: Better than 43 dB
Frequency Response	: 70 Hz - 7 kHz (3H mode)

Video

Input	: 1.0 V (p-p), 75 Ω BNC plug
Output	: 1.0 V (p-p), 75 Ω, BNC plug
Signal-to-Noise Ratio	: Better than 42 dB
Horizontal Resolution	: More than 330 lines (Black & White) More than 240 lines (Colour)

Connectors

ALM Input	: Screw terminal for starting alarm recording
RST Input	: Screw terminal for finishing alarm recording or for adjusting on-screen clock
REC Input	: Screw terminal for starting/finishing recording or for series recording
GND	: Screw terminal for ground
ALM Output	: Screw terminal for output while alarm recording is under way
CLK Output	: Screw terminal to command camera switching
MODE Output	: Screw terminal for indication of VCR selected mode
CALL Output	: Screw terminal for external warning device or for series recording

Weight and dimensions shown are approximate.
Design and specifications are subject to change without notice.

(*1)
Tape Speed and Recording Time:

E-180		E-240		TAPE SPEED (mm/s)	RECORDING INTERVAL (s/field)	NUMBER OF RECORDING FIELDS (fields/s)	VIDEO SIGNAL	AUDIO SIGNAL	TAPE DRIVE
MODE	TIME (hour:minute)	MODE	TIME (hour:minute)						
3H (SP)	3:00	4H (SP)	4:00	23.39	0.0200	50	Continuous	Recordable	Continuous
L12H (SP)	15:00	L16H (SP)	20:00	4.68	0.100	10	Time Lapse	Recordable	Continuous (Slow)
L24H (SP)	27:00	L32H (SP)	36:00	2.60	0.180	5.6	Time Lapse	Recordable	Continuous (Slow)
48H (SP)	51:00	64H (SP)	68:00	–	0.340	2.9	Time Lapse	Not recorded	Time Lapse
72H (SP)	75:00	96H (SP)	100:00	–	0.500	2	Time Lapse	Not recorded	Time Lapse
96H (SP)	99:00	128H (SP)	132:00	–	0.660	1.5	Time Lapse	Not recorded	Time Lapse
120H (SP)	123:00	160H (SP)	164:00	–	0.820	1.2	Time Lapse	Not recorded	Time Lapse
168H (SP)	171:00	224H (SP)	228:00	–	1.140	0.88	Time Lapse	Not recorded	Time Lapse
0H (SP)	–	0H (SP)	–	–	–	–	Time Lapse	Not recorded	Time Lapse

Note

If the VCR is not working correctly or showing an unusual indication on the fluorescent display, press **RESET** button at the rear panel with a pointed instrument. When pressed, Date/Present time/ALARM LIST/POWER LOSS LIST/Counter display/Recording and Playback mode will be set to the default setting and the VCR turns off.
To restart the VCR, press POWER button to turn on the VCR and then set the day and present time.

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